

The Mining Journal

Established 1835

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LONDON, JULY 13, 1951

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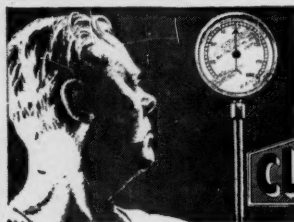
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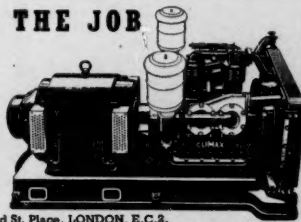
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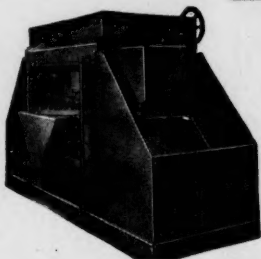
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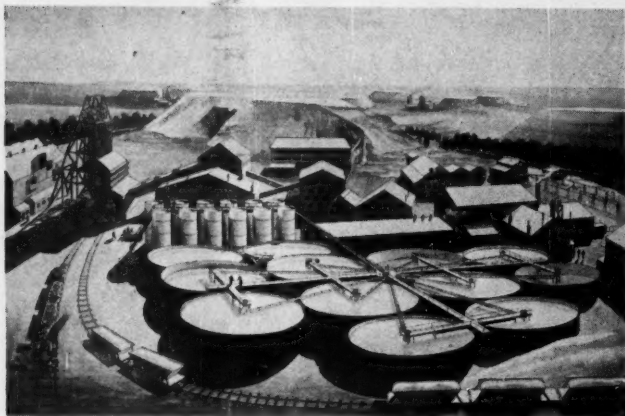
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THIS WEEK'S FEATURES

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NOTES AND COMMENTS

Financing the Development of the Rhodesias

The recent report that the U.S. Economic Co-operation Administration is to loan about £3,000,000 to finance increased copper production of the Mufulira Copper Mine in Northern Rhodesia (see p. 563 of *The Mining Journal* for June 8, 1951) has now been followed by another E.C.A. loan of £5,000,000 to improve the railway systems of both Northern and Southern Rhodesia—a development of the utmost importance as it lays the basis for further economic development of Central Africa and, as a consequence, increasing quantities of raw material supplies entering world trade will become available. In addition, U.S. deficiency in certain metals, such as cobalt, copper, chrome and tungsten will to a certain extent be made good, for repayment of the loan (to be spread over 15 years) is to be made to the fullest possible extent in raw materials. In fact, repayment is to commence at the end of this year, rising as output expands.

A large part of the loan will be spent on locomotives and rolling stock and it is reported that many orders have already been booked by firms in this country. Moreover, improvements will be made to the permanent way and other facilities will be provided which will all help in opening up the rich natural resources of the two Colonies.

An important section of the agreement relates to the supply of coal from the Wankie Collieries in South Rhodesia to the North Rhodesian copper belt. It stipulates that from a monthly output, at Wankie, of 200,000 tons or over, a fixed percentage will be allocated to the copper belt. This percentage will increase as coal output rises. Output has amounted to 170,000-180,000 tons in recent months, but it is expected that it will reach about 200,000 tons this month. These increasing coal supplies should aid in restoring copper output, which is at present about 20 per cent below potential production.

An intensive survey by E.C.A. in co-operation with the Colonial Office, Northern Rhodesia, and Tanganyika, for another railway project in Africa—a new link between Northern Rhodesia and East Africa—is also at present being carried out.

Another major project, planned for that part of Africa, is the harnessing of the Zambesi River at Kariba Gorge in Southern Rhodesia to generate 1,000 megawatts, recommended by the Inter-Territorial Hydro-Electric Power Commission, established by the Central African Council, whose report has recently been published. Based on

prices in November 1950, this project will cost £74,500,000. The above Commission recommends that the scheme be started at once.

Its construction would effect direct savings of considerable capital sums for provision of rail transport and water supplies that would otherwise be needed. It would conserve and make available for other purposes valuable coal resources and make a major contribution to the Zambesi river, leading eventually to other benefits, such as waterborne transport.

To carry out its recommendation, the Commission proposed that a Rhodesian hydro-electric power authority be established to finance, control and administer all installations at Kariba, together with transmission lines and other equipment. It also proposed a conference of interested countries to set up a Zambesi River Authority.

Further E.C.A. Loan to Develop Bauxite Mining in Jamaica

A further Marshall Plan loan to increase production of bauxite in Jamaica was announced earlier this week by Mr. William L. Batt, Minister in charge of the E.C.A. Mission to the U.K. This contract is the third to be signed by E.C.A. for the mining of bauxite in the British West Indies. In January, 1950, the E.C.A. signed a contract with the Reynolds Metal Co. of Richmond, Virginia in which E.C.A. agreed to advance up to \$5,963,000 in Marshall Plan dollars and £1,800,000 in counterpart funds to promote a bauxite project in Jamaica. Subsequently, in September last E.C.A. advanced to Jamaica Bauxite, Ltd., the subsidiary of the Canadian firm Aluminium, Ltd., \$2,500,000 and £1,500,000 in counterpart Funds for help in the construction of a bauxite processing plant.

The new agreement whereby the E.C.A. would advance \$3,284,000 to Reynolds Jamaica Mines, Ltd., bringing the total advanced by E.C.A. for Jamaican bauxite development to \$11,747,000 and £3,300,000 in counterpart funds follows a similar pattern to the previous loans. Repayment of the E.C.A. advance with interest will be made in supplies of aluminium over an 11½ year period. The new agreement also contains the provision that in addition to the aluminium to be delivered under the contract, the U.S. Government will have the option to purchase for dollars not less than \$750,000 nor more than \$1,500,000 worth of aluminium.

Reynolds will also spend approximately £450,000 on its

expansion programme, which provides for the acquisition of new land in Jamaica for bauxite development and for a 70 per cent increase in mining equipment. Other provisions include construction of a new power plant to enable Reynolds to supply its own electricity; an oil pipeline and pumping station to convey fuel oil from oil storage tanks across the mountains to the mine sites; new roads and construction equipment and an additional storage yard and handling equipment. The programme is scheduled to be completed early in 1952.

The background information concerning the discovery of bauxite in Jamaica and details of the first two loans were reported in the issue of September 8, 1950 of *The Mining Journal*, on page 223 under the title "Outlook for Bauxite in Jamaica."

After Titanium, Mica?

According to a Reuter report from Schenectady, State of New York, this week, an important development in the production of mica suitable for electrical insulation from domestic scrap has been announced by the President of Mica Insulator Co. The process is based on the work of the late M. Jacques Bardet in France just before the war. The United States is the largest producer in the world of mica, with an output, in 1948, of 47,316 tonnes, India in the same year being credited with 17,383 tonnes. But as regards the more valuable commercial variety, sheet mica, India produces some 90 per cent of the world output, with a total export, in 1948, of 10,825 tons of block and splittings, and 7,273 tons of scrap mica; whereas the U.S. production of sheet was only 135 s.tons.

Mica is an absolutely essential element in the electrical industry, being as important as copper, besides having many other important applications. Since 1948 the mica production of the world appears to have increased very substantially, especially from Brazil which is now considered a potential competitor with the best Indian grades, but the Brazilian workers lack the skill in splitting the mica sheet inherited through generations by the Indian worker and a substantial amount of the output was exported to India to be dressed there, until the Indian Government refused to grant import licences in 1948.

A company has been formed in the United States to work the Bardet patents with the title of the Samica Corporation. The outline of the process is the reduction of the raw material by chemical and heat treatment to a pulp which is formed into continuous thin sheets by an adaption of paper making techniques. Deposits of mica suitable only for scrap are very extensive in the western hemisphere, but labour costs have made their economic exploitation unattractive. Hand labour would be almost entirely eliminated in the new process which, it is claimed, may end the dependence of the United States on foreign sources of this critical material. Should the anticipations entertained of the success of the new process be realized what has been to a large extent an Indian monopoly may experience a similar challenge to that which the discovery of the big titaniferous deposits of Allard Lake in Canada and the development of titanium metal production now threaten her in another field.

Reuters Centenary

The second half of the often quoted, but not always observed dictum of C. P. Scott, the famous editor of *The Manchester Guardian*, "Comment is free, but facts are sacred," is the guiding principle of Reuters—a British institution, which celebrated the centenary of its foundation this week. Its history is an example of how a man of integrity and character can create, from humble origins, an enterprise the name of which has become a household word. One hundred years ago, the founder of Reuters, Paul Julius Reuter, the son

of a Rabbi, born in 1816 in Cassel, the capital of Hesse, settled in England after having left Prussia in 1848, together with other liberal-minded people. Having gained experience in gathering and distributing news in Paris and Aix-la-Chapelle, he laid in London the foundations of his service, assisted by a 12-year old office boy, transcribing all messages by hand and delivering them to merchants and stockbrokers. To-day, a London staff of 100 serve newspapers, periodicals and private subscribers in 50 different countries through local agencies, branch offices or by direct service. Political and industrial news, commodity movements and Stock Exchange prices are distributed daily from London all over the world in some 25 languages, by wireless, teleprinter, cable telephone and mail. Unfortunately, lack of space makes it impossible to trace here in greater detail the interesting story of the development of Reuters; suffice to say that many a difficulty had to be overcome before the original structure, as a privately-owned concern, was replaced by the present Commonwealth-owned Trust. Journalists and indeed all those to whom the Freedom of the Press is not a mere cliché wish the virile centenarian many happy returns.

Mining in the French Cameroons

According to an article in the June, 1951, issue of our French contemporary *Echo des Mines et de la Métallurgie*, three minerals are at present being exploited in the French Cameroons, viz.: gold, cassiterite, and rutile.

As regards gold, there are numerous occurrences throughout the territory, but notably in the eastern parts. The centre of exploitation is Bétaré-Oya. In the remainder of the territory, exploitation was intermittent and of little importance. Exploitation—which is done chiefly by manual methods—started in 1934 and, by the end of last year, a total of 7,220 kilogrammes had been won. Annual output, which reached a peak of 717 kilogrammes during the war, has declined continuously and was (in kg.) 33 in 1948; 278 in 1949 and 223 last year. The chief reasons for this decline are the exhaustion of alluvial deposits; lack of interest of labour for work in mines (there was a fall in workers in the gold mining region from 3,100 in 1949 to 2,300 last year), and the price of gold which does not provide an incentive for large-scale investments. It is interesting to note in this connexion that two attempts at mechanization were made, but results were disappointing because of insufficient preliminary work.

Only one occurrence of cassiterite is being exploited, viz., at Mayo Darlé, not far from the frontier of the British Cameroons. Discovered in 1927, it has been worked since 1933. By the end of last year, it yielded 4,400 tonnes of cassiterite of 70-71 per cent tin, representing, at the current high tin price, a value of 1,500 million C.F.A. francs. After having at one time reached 350 tonnes p.a., output fluctuated during the last few years around the 100 tonne-mark as a result of the progressive exhaustion of the alluvial deposits. However, there are numerous favourable indications of the presence of cassiterite and a considerable amount of prospecting is stated to be actually under way.

As to rutile, which has been exploited since 1935, this valuable source of titanium occurs abundantly in the interior in a perimeter of 50,000 kilometres centred at Yaoundé. Output, which was insignificant before the war, was increased materially between 1939 and 1945 and reached 3,320 tonnes in 1944, but declined to the neighbourhood of 400 tonnes in 1949 and to a few ten tonne lots in 1950, because extraction takes place under very unfavourable economic conditions and cannot compete with the Australian mineral in world markets. By the end of 1950, total output aggregated some 15,500 tonnes, valued 300,000,000 C.F.A. francs.

South Africa

(From Our Own Correspondent)

Johannesburg, July 1

The subjects to which most attention has been paid by mining circles during the past month have been costs, capital and coal. They are basic problems which will have to be solved if the rate of productivity of the existing mines is to be maintained and the earning power of the new mines achieved as soon as possible.

A survey of the impact of rising costs on individual mines and the industry was the theme of a number of chairman's speeches at the annual meeting season just concluded.

Mr. R. B. Hagart, in his presidential address to the Chamber of Mines, pointed out that compared with the first five months to May, 1949, working costs of gold mines for the comparable period of this year have risen from 26s. 6d. to 31s. 1d. per ton milled, or from 132s. 3d. to 164s. 11d. per f.oz.—an increase of $17\frac{1}{2}$ per cent per ton milled, or of $24\frac{1}{2}$ per cent in terms of each oz. of gold produced.

So far as profits are concerned, the effect of this rise in costs has been masked by the sale of approximately 40 per cent of the mines' output at premium prices, but it has been somewhat startling to learn that no less than 13 of the well-known mines are earning less than 5s. per ton milled, when the total output is taken into account at the standard price of \$35 an oz. Mr. Hagart made the point that the industry was not in grave difficulties as was the case immediately before devaluation, but the basic fact remains that every increase in the cost of producing gold places quantities of unmined ore beyond economic reach and is, in effect, a waste of the country's natural resources.

From the industry's side, every effort is being made to combat the rise in costs by economy and efficient organization, but this cannot counter the relentless increase in the cost of goods and services which is inherent in the present world situation.

It was announced at the end of last month that arrangements had been completed for the provision of the capital necessary to bring Stilfontein G.M. to the production stage and for the initial requirements for the opening up of the two new mines immediately to the south of it on the farms Hartbeestfontein and Buifelsfontein. The bulk of this is to be provided by the Anglo American Corporation and its associates—the chief of which is understood to be De Beers Industrial Corporation—by means of loans, which will be the first charge on future profits.

CHANGES IN MINING FINANCE

This arrangement has been criticized by London financial circles, as have been a number of other similar loans to mining companies in recent years. The main basis of this criticism is that an increasingly long time is now being taken before the ordinary shareholder reaps the full benefits of his initial speculative outlay. This is certainly the case, but changing conditions in the field of mining finance have brought about a situation where the industry is having to rely to an increasing extent on institutional savings for capital funds.

In the past, the system followed was an initial call for speculative capital to provide the funds for exploration and proving a deposit, followed, at a later stage, by an issue of additional shares to finance production. As must be realized, the volume of capital available for such purposes is by no means unlimited either in London or Johannesburg.

The rapid opening of the Free State and the Far West Rand virtually drained this pool dry in the first stages of the development of the fields, and relatively little was left for the second step. This has been clearly shown for some

time past in the reactions of the stock exchanges to the news of fresh capital issues by various companies. Previously, the price of the share concerned improved as shareholders regarded the rights accruing to them from such an issue as a form of capital appreciation. Recently, however, the reverse has been the case, as shareholders lacking the funds needed to take up such rights have sold them, and the value of their existing holdings, expressed in terms of future dividends, have declined.

A further factor has been the increasing cost of opening up a new property. In the case of the two new Klerksdorp properties mentioned above, this will be of the order of £7,000,000 each. Apart from the difficulty of raising such amounts from the public, if the eventual capitalization of a property was this amount, the dividends per share would be relatively low as would the market price of the stock. Since a very large proportion of the initial capital for mining enterprises comes from members of the public who look to pre-production capital appreciation, it is doubtful whether this amount of money could be obtained from the issue of ordinary shares.

It is for these reasons that institutional financing is playing a growing part in the financing of the new mines. In effect, it postpones the date when the ordinary shareholder can obtain the full benefit of distributable profits, but it does ensure that when he does get them, they are based on a reasonable capital structure, and not one which would result in low returns, not commensurate with these normally expected from mining companies.

Apart from purely financial considerations, one interesting point to emerge from this development—which most people here think has come to stay—is that the day of the independent mining concern has passed for ever. Only the big groups are in a position to raise loans of the magnitude required in the opening up of a modern property, for because of the nature of mining operation they are unsecured. In addition, only the established mining houses with huge resources of their own will be able to embark upon such schemes, for any newcomers would have the gravest difficulty in raising the necessary funds in any of the ordinary money markets.

COAL AND TRANSPORT PROBLEMS

The third question which has been absorbing attention here is a coal shortage which coincided with a severe cold spell throughout the country. Apart from the discomfort resulting from this—those readers who know exactly how cold it can be in Johannesburg in mid-winter will appreciate it—it has brought to a head the difficulties facing the country because the development of its transport service has not kept pace with industrial development in recent years. The shortage of coal which has become more pronounced each winter has been further aggravated by a "go-slow strike" of railway artisans. The gold mining industry has not been directly affected, since the Eskom power stations which supply it are sited on coal deposits and no question of transport of fuel arises. It has, however, had secondary effects through the decline in the manufacture of cement, bricks and because of the interruption of certain secondary industries.

Other mining activities have been hit, notably manganese and chrome ore, as railway trucks and engines allocated have been commandeered to transport coal. Earnings by these concerns have fallen and although they have large forward contracts for the export trade, shipments are being sharply reduced.

The export of coal has been stopped until the end of July, which is a blow to the collieries, since the fixed internal price of coal is barely profitable and they are looking to exports for their prosperity. The only solution of the problem is the electrification of the Witbank-Pretoria railway line in order to speed up coal traffic.

Continuous Mining at Donisthorpe Colliery

By H. B. BENNETT

The following article gives extracts from a paper presented at the one hundred and eighth General Meeting of the Institution of Mining Engineers, held at Nottingham University on July 4, 1951, in which the author records 12 months' experience in shortwall operations with the Joy Continuous Miner in the 8 ft. 6 in. Stockings Seam at Donisthorpe Colliery. The Continuous Miner combines the operations of cutting and loading, and completely eliminates shorthifting. It is serviced by shuttle-cars, followed up by belt-conveyors. The author describes the machine in some detail, and illustrates the method of operation. The results of an extended time study on the performance of the Miner are also given, and, despite it being a prototype machine, shows it to be fully productive during 60 per cent of its available working time on a double-shift operation.

Continuous mining is a means of producing maximum output from minimum face room, thereby requiring minimum staff and maintenance. This, in the face of a declining labour force, must have much to commend it in the future.

The experiments undertaken at Donisthorpe have been with the Joy Continuous Miner (Low type J.C.M.3), as illustrated.

The Continuous Miner arrived at Donisthorpe in December 1949, and the first six weeks of 1950 were taken up in preparing the district, including the installation of conveyors, and the making and equipping of power-stations, the whole of the Joy Continuous Miner installation being D.C. The plant housed in the main generator station, comprising two 150 kVA 3,300/500 V transformers, feeding three 75 kVA generator sets, with their necessary switchgear, must strike anyone as being unusually heavy to meet the needs of one machine, but beyond placing on record our appreciation of the assistance given by the electrical department in paralleling the three conveyor sets, little requires to be said, as it was understood that any future installation would be simplified by the provision of a rectifier. The whole question of power-supply, however, is now considerably eased by the manufacture of A.C. Continuous Miners.

The main central head is used for conveying, but the first conveyor runs at 450 ft./min. in order that shuttle-cars may discharge their 3-ton loads without delay. This conveyor delivers into a hopper, through the base of which runs a slow-moving chain, thus spreading the load as it passes on to an ordinary speed 30-in. conveyor, thence to the main trunk system.

Having established a simple ventilation circuit in the preparation stage of the development, the Continuous Miner was put to work on February 13, 1950, and was confined to single-shift working for a fortnight, while the machine was "broken in" and the crew trained. Subsequently, double-shift working was established.

DESCRIPTION OF THE CONTINUOUS MINER

The Miner, which weighs approximately 15 tons and is 26 ft. long \times 7½ ft. wide \times 2 ft. 10 in. high, is composed of three principal parts: (a) Turntable mounted on

caterpillars; (b) Ripper-bar or cutting element, and (c) Discharge boom conveyor.

The ripper-bar, which also functions as the loading head, comprises six standard cutter-chains running vertically to the coal-seam. These are seven-line chains, and run at 500 ft./min., each chain containing 20 carbide-tipped bits. The overall width of the ripper-bar is 30 in., and it is capable of an 18-inch forward movement without the main chassis moving on its caterpillars. It has a vertical shear of 5 ft. 4 in. and the horizontal swing is 16 ft. from rib to rib. These movements are achieved hydraulically, except for the cutter-chains, which are

driven by two 65-h.p. motors.

The Miner carries two conveyors, an intermediate one immediately behind the ripper-bar delivering the coal into a small hopper, and a discharge conveyor from the hopper to the outbye end of the machine. The latter conveyor can be swung 45° right or left to allow cornering, and both conveyors have chain speeds of 200 ft./min. The intermediate conveyor takes its drive through V-ropes from the shaft of one of the 65-h.p. motors, two separate 5-h.p. motors drive the discharge conveyor.

The shaft of the second 65-h.p. motor also carries a similar V-rope pulley. This drives an oil-pump, which in turn provides power to drive the small oil-turbines operating the scrolls. There are two scrolls, and their function is to gather in the gummings and spillage to a dead-plate under the ripper-bar. As the machine advances, the gummings are pushed up this plate to the small intermediate conveyor. In addition to the scrolls, or screws, revolving in their barrels, a

scooping motion is imparted to them by hydraulic jacks, and a second set of jacks allows them to be lifted for flitting purposes.

MOTORS EMPLOYED

The two caterpillars are powered independently by 7½-h.p. motors as on any normal Joy Loader, and a further 10-h.p. motor is provided to drive the main hydraulic pump. Thus the machine carries a total of 7 motors, aggregating 165 h.p.

Three high-pressure water-sprays are provided for dust suppression, the same water being used for cooling the 65-h.p. motors. At Donisthorpe the fire-fighting mains are used for this purpose, and a pressure of 320 p.s.i. is



The Joy Continuous Miner

available from the shaft-head, thereby rendering boosting pumps unnecessary. Consumption is about 5 gal./min.

The Miner is advanced on its caterpillars along the centre of the heading until the ripper-bar, in its retracted position, is just touching the coal-face. The ripper-head is then swung to the right or left rib side and at the same time is dropped until the bits just touch the floor. It is sumped into the solid coal to a depth of 18 in. and a vertical shear is made to the desired roof level. The head is then retracted, freeing any coal that may be adhering to the roof, thus completing in 40 sec. this part of the cycle responsible for the extraction of a block of coal 30 in. \times 18 in. \times the permitted height of the shear.

By swinging the ripper head 30 in., and simultaneously dropping it, the operation can be repeated. Due to the semi-circular shape of the coal-face, and the necessity of slightly overlapping the shear cuts, eight such operations are required to cover the whole width of the heading and thus complete the full cycle. On completion of the cycle, the entire machine is moved forward 18 in. and the process is repeated.

Straighter ribs are possible if a 16-ft. wide heading can be permitted, as this is the full arc of swing of the ripper-bar when the body of the machine is positioned under the centre-line of the heading. By the same rule, a more even roof is made where the machine can be given its full travel when shearing, rather than making a roof at an intermediate point. If these conditions can be realized, the machine will operate at maximum efficiency.

Another feature of the ripper-head is the automatic cut-off of the water used for dust suppression. As the head retracts, the water is automatically cut off so that it cannot run to waste nor give troublesome floor conditions for the shuttle-cars.

The method adopted for handling the coal between the Miner at the face and the conveyor system is as follows:

TRANSPORT

A 42D Shuttle-car with a specially elevated discharge is employed as a receiving-bin for the coal as it is delivered from the Miner. Two standard 32D battery-driven cars shuttle this coal in 3-ton loads from this bin to the high-speed belt-conveyor in the main central heading.

An interesting point with regard to the 42D car or surge bin is the manner in which continuous mining is achieved during the intermittent periods while the 32D shuttle-cars are travelling to and from the conveyors. It consists of removing half of the flights from the scraper-chain which runs on the floor of the surge bin; this means that when the coal has been transferred from the bin to the shuttle-car, the floor of the former is clear of chain-flights (the flights now being on the return half of the chain and under the floor of the bin). Therefore, the reloading of the bin can continue uninterrupted by inching the chain, and no spillage will occur at the discharge end.

Normally, except between shifts when the 42D surge bin is run back to the charging station for battery changing, it is anchored to the Continuous Miner so that a

driver can be eliminated. The Miner operator is given a switch with which he can remotely control the loading of the bin car, while a second remote switch, provided at a convenient point outbye, allows the drivers of the shuttles to transfer the coal into their own cars.

The total labour force employed in the Continuous Miner district, from the trunk-conveyor system to the face, is 20 men, made up as follows:—

	Day-shift	After-noon-shift	Total
Operator	1	1	2
Assistants, responsible for timbering, cleaning up, etc. ...	2	2	4
Shuttle-car drivers	2	2	4
Conveyor attendants (assisted by sequence control)	1	1	2
Material handlers	2	—	2
Fitters	1	1	2
Electricians	1	1	2
Deputies	1	1	2
	11	9	20

Unfortunately, the practice at Donisthorpe has been to segregate electrical and mechanical departments, otherwise an electrical fitter would suffice on each operating shift, thereby saving two men. Better still, four men could be saved by employing electrical mechanics as machine-operators, and this would have the advantage of solving the wage differentiation problem.

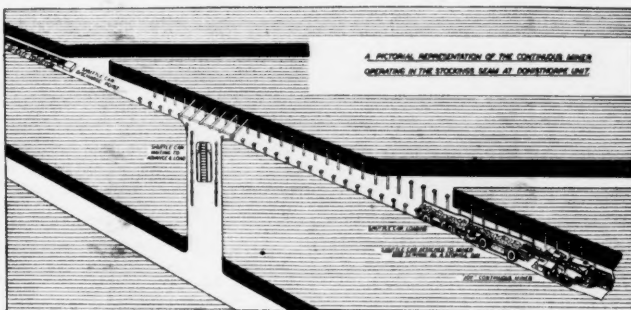
It will be seen that material handlers are not repeated on the second shift. The day-shift men merely take supplies to the charging-station at the entrance to the section, and can comfortably cater for both shifts. From this station the on-coming shift pick up sufficient materials and convey them to the face in shuttle-cars.

The headings are driven at an average rate of approximately 120 ft. a day of two shifts and produce 400 tons. The record drive of a single head in one day is 200 ft. O.M.S. of about 60 tons at the face and 20 tons for the whole of the district are obtained. During the four weeks from June 5 to 30, 1951, 7,280 tons were loaded in 39 shifts and the number of cars filled was 2,445. Delays expressed as a percentage of total shift time worked amounted to 39.92 and it was felt that the achievement of 60 per cent of the total available working time spent in full production was reasonably satisfactory. A table summing up the results of time studies taken on the Joy Continuous Miner appears in the paper.

TEETHING TROUBLES

Many hindrances which might be expected on such a complex machine as the Continuous Miner, while they could not be countenanced on conventional longwall faces, where the loss of a cycle involving a considerable labour force might be suffered, are not of such great consequence in a continuous system employing a small crew. The machine merely continues where it left off.

Breakdowns, it must be admitted, have been fairly numerous, ranging from breakages of the main frame, necessitating welding and stiffening, to the almost daily



failure of hydraulic hoses. When one considers that the machine has no less than 84 hoses of varying size, continually flexing in both horizontal and vertical planes, it will be readily appreciated that many "teething troubles" could be expected. Breakdowns due to hose failure are far more numerous than those from all other causes, but their duration is usually relatively short, frequently a matter of a few minutes. Spare hoses for the more vulnerable points are prepared in correct lengths and held in stock on the job, and this is facilitated by the provision of a fitters' bench equipped with vice, and embodying a store cupboard.

The greatest trouble experienced was with the scrolls for cleaning up gummings and spillage. They were greatly underpowered, and it was not until a British firm of hydraulic engineers supplied a more efficient pump and better motors that this difficulty was overcome.

Heavier lifting-jackets and anchor-chains have been fitted to the ripper-bar, thereby eliminating breakdowns which were common in the early days due to this equipment not being sufficiently robust. Little electrical trouble of any description has been experienced. The Stockings Seam is banded with extremely hard coal, but, despite this, the carbide-tipped bits only require changing weekly, and, even then, stand 6 to 8 re-grinds which, expressed in terms of output and allowing for bit losses, approximates to 8,000 tons per set of bits. Cutter-chains are taken off for reconditioning at about 40,000 tons.

The question of maintenance has not been easy. To pioneer a machine produced in America, particularly one so complicated as the Continuous Miner, differs from having the manufacturer "on the doorstep" and available for the supply of spare parts. Frequently, the parts have had to be flown over from New York.

IMPROVED MACHINE DUE FOR DELIVERY

However, since the machine described was a prototype, experience gained by both the U.S.A. and by this country has enabled the manufacturers to develop an improved machine. An A.C. machine, a J.C.M.4 high type, is due for delivery, and is understood to have been considerably strengthened. The hydraulic system has been redesigned and simplified, the main chassis and ripper-head stiffened, and the gumming scrolls increased in power. Chain-sprockets have also been rearranged, so that the bits on all six chains do not strike the coal at the same instant. By staggering, it is claimed that the vibration on the machine has been reduced by 50 per cent.

NOT ONE REPORTABLE ACCIDENT . . .

During the first 12 months' operation there has not been a reportable accident in the Miner district. The system is bound to tend towards greater safety by virtue of such a low man-hour exposure for a very high rate of production, and, in addition, more concentrated supervision is possible. Moreover, not a single shot has been fired, thus representing a saving of some 50,000 shots over conventional methods, in the same seam, for a similar output. A system which eliminates this mining hazard must commend itself to everyone.

It is true that the seam is comparatively free from gas, and ventilation requirements beyond the last breakthrough are met by a 5-h.p. 5,000 cu. ft. per min. fan with 18-in. canvas conduit.

PRODUCT ANALYSED

There is, of course, a considerable increase in the slack percentage of the Miner output as compared with that for longwall. This is not to say that only slack is produced, for the action of the ripper-bar in sumping-in is such that it bursts the coal off on its upward travel, and

this results in quite an appreciable percentage of lumpy coal.

The analyses of two tests are given in Table I. For the purpose of comparison, the sizes produced by conventional methods in the same seam are also given.

TABLE I—SIZING TESTS. CONTINUOUS MINER PRODUCT COMPARED WITH CONVENTIONAL LONGWALL

Size (in.)	Continuous Miner Output				Conventional Longwall Output	
	No. 1 Test		No. 2 Test		Normal Average	
	Weight, %	Cumulative, %	Weight, %	Cumulative, %	Weight, %	Cumulative, %
+6	3.2	3.2	4.4	4.4	13.4	13.4
-6 +4	7.0	10.2	3.1	7.5	7.3	20.7
-4 +2	5.5	15.7	10.3	17.8	15.8	36.5
-2 +1	2.3	18.0	3.0	20.8	5.5	42.0
-1 +1/2	3.0	21.0	2.5	23.3	6.0	48.0
-1/2 +1	4.8	25.8	3.9	27.2	4.9	52.9
-1 +1/4	3.7	29.5	3.7	30.9	7.1	60.0
-1/4 +3/8	10.5	40.0	7.7	38.6	5.4	65.4
-3/8 +1/2	5.7	45.7	10.5	49.1	3.1	68.5
-1/2 +3/4	11.0	56.7	9.8	58.9	5.5	74.0
-3/4 +1	10.0	66.7	14.5	74.4	6.0	80.0
-1 +1/2	17.7	84.4	13.7	88.1	9.6	89.6
-1/2 +3/4	15.6	100.0	11.9	100.0	10.4	100.0

With coking coals, this high degree of degradation would be unimportant, nor is it of serious consequence in the non-coking coals of Donisthorpe, where the increasing demand is mainly for the power-stations of the British Electricity Board.

At the time of recording the experience gained from the experiment undertaken at Donisthorpe, the Miner has just completed 12 months' work, with an output of 91,558 tons of coal.

A detailed statement for a typical month (January 1951) showing Continuous Miner costs, compared with the remainder of Donisthorpe Colliery, is given in Table II. This table also shows the effect of the Miner on the overall colliery results both in regard to costs and O.M.S. achievements.

TABLE II—CONTINUOUS MINER COSTS COMPARED WITH REMAINDER OF DONISTHORPE COLLIERY

Saleable Output	Total Colliery 73,228 tons			Continuous Miner, 8,170 tons			Colliery, excluding Miner, 65,058 tons			Effect on Unit + or -	
	Cost		Cost/ton	Cost		Cost/ton	Cost		Cost/ton		
	£	s. d.		£	s. d.		£	s. d.			
Wages											
(a) Face	29,524	8 0.7	401	0 11.8	29,123	8 11.4	-0	10.7			
(b) Other than Face Under-ground	15,279	4 2.1	1,125	2 9.0	14,154	4 4.2	-0	2.1			
(c) Surface	7,309	2 0.0	816	2 0.0	6,493	2 0.0	-	-			
(d) Guaranteed wages	12	-	-	-	12	-	-	-			
(e) Total wages	52,124	14 2.8	2,342	5 8.8	49,782	15 3.6	-1	0.8			
All other costs including repairs, stores, power, depreciation, etc., etc.											
	38,460	10 6.1	4,234	10 4.4	34,226	10 6.3	-0	0.2			
Total costs	90,584	24 8.9	6,576	16 1.2	84,008	25 9.9	-1	1.0			
Output/man-shift											
At Face	126.7	cwt.		1,068.0	cwt.		114.1	cwt.		+12.6	cwt.
All Under-ground	70.8	"		186.3	"		65.7	"		+5.1	"
Surface and Underground	55.5	"		108.1	"		52.3	"		+3.2	"

It will be seen from a study of the figures that for all operations outbye of the actual Continuous Miner district, the Miner has been debited with costs equal to the remainder of the colliery.

The original planned extraction figure was 45%, half to be taken in advancing and the remainder in splitting pillars. The success of the experiment, as far as the capabilities of the Miner itself were concerned, became evident almost immediately. As a system of mining, however, it was still necessary to prove the merits, or demerits, realizing that a wastage of 55% of unrecovered coal could not be countenanced except under very exceptional circumstances.

It has, therefore, been decided to continue the experiment a stage further by complete extraction of the pillars but at the same time protecting the seams above by solid stowing.

CONCLUSIONS

The Continuous Miner, where applicable, provides a high rate of productivity combined with the efficient utilization of man-power. Measured in terms of O.M.S.,

the rate of production is four times higher than the national average. In addition, an economic system of developing expeditiously a new seam or area is possible with the machine.

One of the main attractions of the shortwall continuous mining system is the possibility of percentage extraction in certain suitable seams underlying densely built-up areas, which, if dependent on conventional methods, would be lost for ever. Similarly, a much shallower limit under water-bearing strata could be safely permitted.

The numerous advantages claimed for mechanized mining methods, employing small teams, e.g., full utilization of shift and the consequent even-spreading of load, avoidance of wage fluctuations, creating greater interest in personnel, etc., are all features of this system.

Lastly, the advantage of completely eliminating shot-firing, and thereby enhancing safety, cannot be over-emphasized.

Improved Procedure for Handling Complex Residues

By C. C. DOWNIE.

One of the features in the plant layout of smelteries equipped for handling all kinds of complex residues is the use of either gas or oil firing so that hearths can be used or shut-down at a moment's notice without any undue loss of fuel. Efforts have been made to introduce pulverised coal burners with specially constructed turbulent nozzles, but exception has to be taken to these where the descending flow of particles introduces too much silica from the ash, and upsets the balance of the slag. However, not a few of the smaller smelting and refining firms unfortunately persevere with the earlier coal-fired hearth, which are never fully satisfactory in spite of prodigious efforts to control accurately the draught. An exception to this is the red-lead furnace, which, as a result of elaborate research, gives a controlled flame which permits the exact proportion of oxygen to be absorbed. A somewhat similar hearth had been constructed in earlier years for crystallizing purposes, but as it necessitated skilled attention, oil or gas-firing was substituted. Pulverized coal firing cannot be considered where efforts are made to separate metals by means of their respective affinities, as the skimmings would then become polluted with ash on the molten surface.

ADVANTAGES OF ELECTRICITY IN SMELTING

For sustained heating processes, electric heat has become too expensive, although it is otherwise the most desirable from the aspect both of cleanliness and ease of regulating within the closest temperature tolerances. Experimental hearths for crystallizing have already been tried out, using resistance elements and controlled airflow. It had been thought that firms interested in precious metals would have been expert in this work, but apparently they have so far given little attention to it, with the result that far from being able to concentrate one particular alloy at the expense of another, the matter has been left as it stands, and the more modern smelters, engaged in handling tin residues, have to some extent left it in abeyance in view of the success of alternative methods. These relate to the use of aluminium for removing antimony, and also to electrolytic refining methods, whereby the crystallizing hearth, or "laboratory" for pyro systems of separating the low melting point alloys, has evidently been made to take a back-seat.

One of the results of not being equipped with proper means of firing is reflected in the unwillingness to tackle certain processes on short notice. This is seen alike in not a few silver methods, such as the manipulation of the Parkes process, the zinc distillation retort, the liquation furnace, and the cupellation of scorifying hearth. Without exception, each of these benefits by firing methods other than earlier coal burning. The slow handling of what is sometimes termed "work lead" for the Parkes system, the poor control of the liquation hearth, and a general avoidance of the use of plenty of zinc, aluminium, or other alloying agents where there is no distillation arrangement, etc., can all be attributed to perseverance with improper firing methods.

RAMIFICATIONS OF THE PARKES PROCESS

In one concern abroad, different ramifications of the Parkes process were utilized, because irrespective of what amount of zinc scums were taken off, the alloyed material was transferred to a small individual retort by an oil burner, and the zinc distilled off, leaving the concentrated silver-lead alloy as the residue. What zinc passed over to the receiver was cast into plates for repeated use. The individual retort was simply housed within a form of brick-lined canopy (not a furnace in the ordinary sense) and connected by a lengthy vertical form of U-delivery line to the receiver and fired by a patented oil burner complete with pressure pumps and controls. Apart from regular operations, where silver-bearing lead contains upwards of 11 per cent antimony, the latter can represent an unwanted material and at times becomes a nuisance. By making appropriate additions of zinc, the silver is not only removed to the crusts by the familiar method, but also the majority of the antimony. Instead of distilling directly, liquation is first applied, and although the liquid portion can still contain from 6 to 6.5 per cent antimony, the residual solid material, which represents 50 per cent of the total, contains upwards of 15 per cent antimony. As details of the aluminium addition have already been published, a repetition of this would not be justified, but it has to be remembered that whereas the zinc can be repeatedly recovered by distillation, the same conditions do not hold good with aluminium. A combined zinc-aluminium addition has certain advantages

in that the aluminium can prevent oxidation of the bath, but instead of making large additions, as are necessary in antimony removal, 0.5 per cent is often sufficient and permits liquation of the collected scum. In one arrangement, the ordinary Parkes process occupied nearly three days in handling the 96 cwt. of lead, containing several hundred ounces of silver per ton. After refining, the lead, freed from the zinc crusts, etc., only amounted to 53 cwt. and could contain as little as 0.5 oz. per ton of silver, although frequently up to 5 oz. per ton, and required 40 lb. of zinc, added either six or seven times. The time occupied was unduly long, while the subsequent removal of the rich zinc skimmings to the cleaning furnace, where all zinc was burned off and dissipated, was doubtfully economical and, further, tended to restrict the use of surplus zinc.

ADVANTAGES OF IMPROVED EQUIPMENT

Provided the individual zinc retort layout, oil-fired liquation hearth, and the necessary accessories are used, the work can be materially speeded-up. For example, instead of taking off the hard zinc crusts as skimmings, and slowly awaiting the rising of the remaining zinc alloy dispersed throughout the mass, an automatic mechanical device is employed in modern smelteries, and this is also utilized for the liquated products. It comprises a jaw-like claw with perforations, which is periodically introduced into the bath, then upraised, and pressure applied to squeeze out mechanically all easily fusible matter before the temperature has fallen materially. Likewise, the lengthy steaming treatment to remove zinc remnants from the final lead can be obviated by judicious additions of aluminium, since what little of the latter metal remains is up-raised by a cryolite preparation, and is then directly skimmed off. The use of aluminium in this work, despite apparent advantages, has been criticized, and the earlier zinc desilverizing revived, largely because these more modern improvements were not understood. Whereas some of the older smelteries persist in manual stirring of the bath, U.S. firms use a power-driven revolving paddle at a pre-determined number of revolutions per minute, besides the use of a patented magnesium-calcium alloy to collect bismuth.

In the normal way, lead is softened to remove surplus antimony, as this metal was considered injurious to the ordinary system, but softening is a somewhat laborious treatment, and it was suggested that more use could have been made of the aluminium alloying principle, but again taking advantage of recent furnace designs. A work lead containing 0.3 per cent antimony, 0.1 per cent copper, 0.5 per cent arsenic, and 100 oz. per ton silver, had but little silver extracted by using 0.2 per cent zinc, although the copper and arsenic were reduced some 85 per cent, while a further addition cut out the antimony. But a much cruder form of lead, containing larger proportions of impurities, can generally be conveniently handled with increased proportions of zinc-aluminium alloy, provided the appropriate plant mentioned is available. The following is an extract from a standard work: "As zinc boils in a vacuum at a much lower temperature than at the ordinary pressure, the question suggests itself as to whether suitable apparatus could not be devised for affecting the distillation under reduced pressure."

As a matter of fact, equipment of the kind had been introduced for large-scale use nearly 25 years ago. This vacuum distillation hearth could permit zinc to be distilled off from all kinds of other associated metals, which, although at first sight appearing liable to contaminate the zinc, only really melt at low temperatures, and will not boil-off. In the ordinary retort and receiver, lead, tin, antimony and iron, etc., pass into the spelter, and

with the exception that the cadmium is filtered by the Brand or other similar system, there is but little removal of these volatile impurities.

What would appear to be one of the prevailing weaknesses in training students in the fundamentals of smelting generally is the lack of definite information on relative affinities, or alternatively, the means for rendering existing affinities more definite and pronounced. It is taken for granted that pyro separation methods are somewhat crude and too easily upset in practice to permit much utilization. On the other hand, there is evidently some misunderstanding in linking up oxidation with volatility, and fusibility with viscosity. For example, with the foregoing work, when lead is oxidized by air playing over the surface, as it does in the "test" or cupellation hearth, the reactions differ materially from where air is directly blown through the same lead. Although in both instances zinc followed by iron are amongst the first to be oxidized, the order differs from there onwards.

During scorifying, nickel follows iron in oxidizing, but not necessarily so where air is directly blown through the molten mass.

The volatility of lead has to be taken into account, and causes it to pass away before the nickel, but a much more pronounced example is that of bismuth which oxidizes in the blast before nickel, whereas during scorifying, bismuth is the very last of the base metals to remain unoxidized. Two processes are taken advantage of in this latter connection, namely the electro-refining of bismuth, and the recovery of bismuth as an anode sludge from the electrolytic production of white lead. Had the molten bath been exposed to a powerful air-blast, the losses of bismuth which would have been sustained would have been considerable, and rendered either electrolytic system uneconomical. No small controversy existed in earlier years as to whether lead or copper were most readily oxidized, as both appeared to be very near each other, i.e., in so far as scorifying is concerned.

GERMAN PROCESS FOR CONCENTRATING NICKEL

No room for doubt is left where the air-blast is applied, since the volatility feature asserts itself in respect of lead, and where down to a certain fixed percentage the lead is removed in bulk, while but little copper is oxidised. These facts as to exact oxidizing relations is borne out in a process which was carried out in Germany, for some time for concentrating nickel at the expense of copper, but which largely depended upon the availability of cheap fuel and cheap labour. By oxidizing collected alloys of these metals under approved conditions, the nickel mainly passed to the skimmings, leaving the copper more or less unoxidized, but the process had to be repeated many times. On reducing the oxidized mass in another hearth, whatever percentage of copper had been oxidized was returned to the metallic state. The original material could contain less than 40 per cent nickel, and by stages was raised successively to 60, 80, and eventually to nearly 90 per cent nickel by this means alone. In the copper converter, the iron is removed not because copper has a greater affinity for sulphur, but because iron has a greater affinity for oxygen, and copper can only take the sulphur from FeS when surplus oxygen is present, not when oxygen is absent. This is borne out in the electric furnace where, when iron is added to a pure copper sulphide, the copper is thrown out, and the iron forms iron sulphide, i.e., under strongly reducing conditions.

These represent only a few of many reactions which appear to have been either inaccurately or inadequately dealt with due to following regular ore smelting practice, and without having the advantage of more exacting furnace designs.

Technical Briefs

Lead-Lined Electrolytic Cells in New U.S. Copper Refinery

One of the world's largest electrolytic copper refineries located at Garfield, Utah, and built by the Utah Copper Division of the Kennecott Copper Corporation, has recently gone into production, according to *Lead* (No. 4, 1951). This new plant will contribute 144,000 tons of refined copper to U.S. supply each year.

The ten buildings that make up the new refinery cover about nine acres. The largest of these, the tank house, covers some 225,000 sq. ft. and houses 1,346 electrolytic cells, 6 motor-generator sets and auxiliary equipment.

In the design and construction of the new refinery, the most modern equipment and the latest methods have been used. The cells are 3 ft. 7 in. wide, 4 ft. deep and 13 ft. 6 in. long (inside measurement). They are constructed of reinforced concrete lined throughout with 8 lb. hard lead (3 per cent antimony). All lead joints are welded. Piping for conducting the corrosive electrolyte and launders and filters for purifying the electrolyte are all either constructed of hard lead or protected with a lining of hard lead. Piping ranges from $\frac{3}{4}$ in. to 12 in. in diameter with wall thicknesses $\frac{1}{4}$ in., $\frac{7}{8}$ in. and $\frac{3}{4}$ in.

The electrolyte is a mixture of about 25 per cent copper sulphate, 18 per cent sulphuric acid and the remainder is condensate with small amounts of impurities. The solution is kept at approximately 140° F. Under these conditions, the use of lead is logical and, as a matter of fact, has shown itself to be the most economical corrosion resistant material to use.

Another important consideration in selecting corrosion resistant linings is the fact that lead has relatively the highest salvage value of any of the common metals.

The Recovery of Flake Mica

A new technique for the recovery of flake mica occurring in weathered granites, alaskites, schists, etc., in sizes varying from 1 in. to below 200 mesh has been described by Adair and co-workers (*Trans. Am. Inst. Min. Met. Eng., Tech. Pub. No. 3023-B*). Plants using a conventional type of flow sheet show losses of material in the size range $\frac{1}{2}$ in. downwards. These losses can be avoided by the use of flotation equipment or jigs and tables, but the authors recommend the use of a Humphreys spiral. This, they say, gives a good separation of the mica from the gangue minerals, and it has the added advantages of lower capital and operating costs, and requires less skilled labour in its operation.

New Dutch Coal-bag Filling Machine

Keen interest is reported both from home and abroad for a new coal-bag filling machine, says Reuter's correspondent at the Hague, production of which has started at Escher's Engineering Works, The Hague, who have applied for a patent. The machine is equipped with adjustable measuring compartments which can be set for different grades of coal so that the final weight delivered to the bag varies only slightly whatever the grade. It is capable of filling 540 bags of 610 cu. in. per hour, while a larger machine is being built for handling coke or anthracite with the same output per hour.

How to Make a Long Splice

British Ropes Limited, Doncaster, have just issued a seven-page booklet dealing with a method of making a long splice. It gives not only the simple straight-forward description, but also mentions a number of the "knacks" acquired by skilled splicers.

New U.S. Furnace Charging System

Charging an open-hearth furnace by the conventional method requires that scrap iron and other charge materials be trundled in on rails on a string of buggies, past the several furnace doors, and each furnace charged as required, states J. J. Jaklitsch, Jr., in "Briefing the Record," published in the January, 1951, issue of *Mechanical Engineering*. While the cars are stopped to charge one furnace, no cars can pass to reach those farther down the line.

A new system of flow described in the *Westinghouse Engineer* (November, 1950), eliminates this possibility by allowing individual charging of any furnace at any time. This method is being installed in a plant of the Armco Steel Co., where four special hydraulic hoists will serve three open-hearth furnaces. Each furnace will have a hoist on either side of its furnace doors. The hoist platforms, some 10 x 20 ft. in size, will be loaded with one charge buggy per elevator on the yard level. The elevator will rotate 90° on its way up to the furnace floor level (about 20 ft. above yard level), so that the buggy can be unloaded in line with the furnace doors. All buggies will run on tracks throughout the length of their journey.

The hoists to accomplish this will be designed to lift a 45,000 lb. load in 30 secs., or a maximum of 60,000 lb. in 38 secs. With the flexibility and speed this system will allow, charging time for one furnace will be cut from 3½ to 1½ hours, that is, a furnace will be charged with its 150-ton load in less than half the usual time.

Chromium Plating Plant for New Zealand

A new company, to be known as Chromafuse (New Zealand), Ltd., is to be formed shortly in Auckland to exploit a method of giving a number of metals a stainless steel finish. The process, developed in Britain during the war, consists of fusing a stainless high chromium alloy into the surface of iron and steel products by penetrating the skin of the metal with chromium. The skin then becomes an integral part of the metal and cannot peel off. Official tests have shown that metals treated in this way have been made resistant to both corrosion and heat.

According to a Reuter report, the company is to purchase the sole right to operate in New Zealand the processes of chrome fusing (chromizing) as well as metal hardening and general metal treatments developed by Diffusion Alloys Ltd., London. It is also to establish in New Zealand a factory or factories to operate such processes.

The promoters of the new company are also negotiating for the sole Australian rights to the process.

The Production of Sulphur from Hydrogen Sulphide

The recovery of sulphur from a gas containing 22 per cent CO₂, 70 per cent H₂S, and 8 per cent H₂O has been described by Maurice Webb (*Oil Gas J.* 49, No. 36, 71, 1951). The feed is mixed with air and burned so that one third of the hydrogen sulphide is converted to sulphur dioxide. The mixture is then reacted over bauxite at 430-655° F., when elemental sulphur is produced. This is condensed out at 290° F., and the residual gas reheated at 460° F. It then enters a second reactor and the temperature rises to 450° F. and the remaining 15 per cent of the reaction takes place. The gas is then passed into a second condenser where the rest of the sulphur is removed.

Methods such as these for the recovery of sulphur from oil gases are becoming increasingly important in view of the present world shortage of sulphur.

Metals, Minerals and Alloys

The whole situation in the metal trades is being viewed through the medium of the negotiations for a settlement in Korea. Even if the unexpected happens, and it develops that the Kremlin has, temporarily at any rate, abandoned its policy of seeking to create world trouble acute differences are likely to develop among politicians and governments as to whether world rearmament should be continued on the projected scale. Both President Truman and Mr. Attlee have urged the necessity of continuing to re-arm for peace, but Mr. Aneurin Bevan and his associates will press for butter before guns and there is a wide range of interests in the United States who will be glad to see the whole policy of metal control, consumption and restriction cast aside. Should the Republican party adopt this as one of their planks in the next Presidential campaign, the confusion in the metal outlook might develop into chaos.

Indicative of the increasing Government control of metal supplies and prices and the general uncertainty of future trends is the drying up of all trading in futures on the N.Y. Commodity Exchange.

Copper.—There is not very much fresh to say about copper this week, but the difficulty about the double price (import and domestic mined) is still unresolved. The Ministry of Supply is believed in the United States to be paying as high as 45c. for Canadian and 46c. for African metal, and to be discussing advancing prices not only for copper but for lead and zinc. This price differentiation, it is feared, will wreck international allocation of copper as recommended by the Copper Committee of the International Materials Conference. A similar fear was expressed by Mr. Grimston in his criticisms of the new copper, lead and zinc scrap Distribution Order in the House of Commons on Monday.

The strike at the Garfield smelter of the A.S. and R. Co. has still to be resolved. The Garfield smelter is said by the company to handle about a quarter of the United States output, say 250,000 tons a year. So far the Kennecott refinery, to which the Garfield crude is sent has not been slowed down, but cutbacks are expected by the end of this week. The N.P.A. has intervened in the strike, not only on account of the copper shortage, but even more because of the threat to the output of sulphuric acid from the roaster gases. Thus it looks as if previous experience is to be repeated, and the company be forced to concede the U.S.W. demands.

Lead.—There is little news regarding this metal. In the United States trade is marking time in anticipation of allocation measures similar to those already imposed in the case of zinc. D.O. orders for August shipments are increasing steadily but allocations are not made until the middle of the month. From the beginning of the month primary and refined lead had been placed under direct allocation in Canada as had already been done with nickel, copper and aluminium.

Tin.—The R.F.C. has not reduced its selling price of 106c. per lb. and unless we learn of a last minute change, we must assume that the G.S.A. purchases will only be for token amounts. This, of course, leaves the purchase of concentrates by the R.F.C. unaffected. Probably however metal purchases—amounting perhaps to some 35,000 tons a year—will cease and this additional supply become available for the open market. Price movements on the London Metal Exchange and in the East are given by our Metal Exchange Correspondent below.

Exports of tin from the Straits in June are given as

5,771 tons compared with 4,970 tons in May. The total for the six months is 32,058 tons, well below the exports for the same period of 1950, which totalled 38,322 tons, but this year's figures, which of course include imports from Siam, Burma, etc., are still well above Malayan production, which when we get the June figures, will probably be around 28,400 tons. Shipments during June were as follows: U.K., 1,729 tons; Europe, 1,668 tons; British possessions, 1,479 tons; other countries, 895 tons. There were again no shipments to the United States. The output of primary tin from the Longhorn smelter in June was lower at 2,665 tons. This makes the output for the first half of the year 18,115 tons compared with 15,258 tons for the first half of 1950 and an average output of just over 3,000 tons a month. This when combined with secondary tin which averaged roughly 2,500 tons a month last year—rising to 3,011 tons in January—represents say 6,000 tons overall. Last year total consumption of primary and secondary was, according to the U.S. Bureau of Mines 102,123 tons. Thus there is a good deal to be said for the opinion of some U.S. commentators that the stockpile is being drawn on.

Portuguese exporters, refused export licences during the first six months of the year, have now, in view of the Anglo-Portuguese Trade Agreement, been invited by the authorities to resubmit their applications.

Zinc.—The N.P.A. has announced that it will take over the complete allocation of slab zinc from August 1. No one may accept delivery of slab zinc unless previously authorized by the authority. The trade has been marking time for the issue of this order. The U.S. Bureau of Mines reports the consumption of zinc in the first four months of the year at 289,162 s.tons compared with 298,441 s.tons in the same period last year. Consumption by manufacturers of brass and bronze products, zinc base alloys and the rolling mills was practically unchanged but galvanizers used about 16,000 s.tons less with a total of 126,033 s.tons. Stocks were practically unchanged on April 30 at 51,214 s.tons. In Canada slab zinc and cadmium have been placed under direct allocation from the beginning of the current month.

Aluminium.—The Defence Production Administration has announced quotas of aluminium for the July-September quarter, including 84,116 s.tons for the Defence Department, 1,250 s.tons to the E.C.A., 174,200 s.tons to U.S. Defence supporting activities and 5,250 s.tons to the Atomic Energy Commission. U.S. production of primary metal in May was 67,721 s.tons almost identical with the April output. For the five months of the current year the total output was 336,138 s.tons (281,166 a year ago). The Norwegian parliament has voted an appropriation of £3,500,000 for the projected new installation at Sunndalsøra, mentioned in the *Mining Journal* of June 29. The total cost of the plant is now estimated, according to Reuter at £17,500,000.

Manganese.—Our South African correspondent in the despatch given in another column, mentions the seriousness of hold-up of the metal industry through shortage of rolling stock. This is emphasized by a Reuter despatch from Johannesburg, which says that shipments of South African manganese and chromite are virtually at a standstill. United States absorbs about half South Africa's manganese production, and the bulk of the world's supply of chemical grade chromite. In Rhodesia thousands of tons of chromite are said to be lying in piles awaiting transport to Beira.

Molybdenum.—The International Materials Conference has agreed on the immediate introduction of an allocations scheme for molybdenum for the third quarter of the year. Of the 4,400 s.tons available, United States

will receive 3,320 s.tons; Britain, 515 s.tons; France, 195 s.tons; Germany, 125 s.tons; and Sweden, 100 s.tons.

Platinum.—The Board of Trade has revoked all licences for the export of platinum metal and alloys as from Monday next.

Sulphur.—The International Materials Conference has announced an allocation of 106,300 tons of crude sulphur to Great Britain for the third quarter of the year. Available world supplies for the quarter are given as 1,415,400 tons. This should secure a continuance of the allowance to industry here on the basis of the scheme put into effect on May 1. It is reported that the Freeport Sulphur Co. is to prospect a number of salt domes in Louisiana either submarine or lacustrine, employing the technique used in the oil industry in shallow waters, such as Lake Maracaibo.

Tungsten.—Uncertainty over the allocation of raw materials continues to dominate the wolfram market here and prevents any clearcut market price being established. No one knows how much wolfram they are likely to get, or when. Present purchasing is restrained by the possibility that material bought to-day will be put against allocations by the Ministry of Supply in the near future. Moreover, buyers are cautious, fearing to pay a higher price than the Ministry of Supply fixes, 530s. c.i.f. being the maximum figure expected. Sellers are asking more than this. Comparatively little business is resulting; some purchases were reported on Tuesday at 535s. c.i.f. On the Continent, Germany has been buying, and at higher prices than we are prepared to pay—somewhere between 540/550s. We call the price 525/540s. c.i.f.

It is reported from Washington that the member governments of the International Material Conference have agreed on the immediate introduction of an allocation scheme for tungsten. Agreement was unanimous except in the case of Brazil. Producers guaranteed not to demand more than \$65 per s.ton, while importers agreed to pay not less than \$55. Third quarter allocations cover 2,800 tons of concentrates, divided as follows: United States, 1,255 s.tons; U.K., 695 s.tons; Germany, 290 s.tons; France, 280 s.tons; Sweden, 210 s.tons; Canada, 26 s.tons; Yugoslavia, 16 s.tons; Australia, 15 s.tons; and Spain, 13 s.tons.

In the United States the Senate Preparedness Subcommittee whose expressions of opinion are sometimes rather sweeping, has characterized the situation in tungsten as "little short of desperate" despite the fact that the stockpile is greater than at the end of the last war. President Truman has ordered the Defence Production Administration to withdraw 320,000 s.t. units from the military stockpile. The Senate Subcommittee has recommended that the Government should be made the sole importer of foreign material and that procurement should be centralized as far as possible under a single agency, working in co-ordination with G.S.A. They also advise that the Administration should prepare a comprehensive programme to stimulate production and procurement of tungsten material abroad, including long term contracts at fixed prices.

Our Portuguese correspondent states that export licences are being freely given to the U.S.A. and Canada but not to the U.K., Sweden or Germany. If an international price be established, involving a substantial reduction from recent figures, this, together with Esc.40 per kilo export tax may cause the activities of the "scratchers and pickers" to cease—Portuguese production depends more upon them than on the mines. As Portugal is the one country near consuming centres in a position to supply this essential ore, anything hampering full activity is to be deprecated.

Gold.—The Transvaal gold output in June was 965,478 f.o.z. compared with 987,342 f.o.z. in May. Production for the first half year was 5,694,823 f.o.z. March pro-

duction in Colombia recovered sharply from the low figures of the previous month and amounted to 41,920 f.o.z. making the total for the first quarter 101,634 f.o.z. against 109,406 f.o.z. a year ago.

The London Metal Market

(From Our Metal Exchange Correspondent)

There has been a complete lack of any interesting features during the last week although the turnovers in London and Singapore have remained well up to average. For some reason which is not apparent there was a distinct change of sentiment for the better at the beginning of the week, and more talk was heard of the possibility of the price being low enough, and that the next movement should be in an upward direction.

It is all the harder to understand this change as the Americans are now in a position definitely to suspend purchases of metal against their Belgian and Indonesian contracts, which must in the long run make more metal available in Europe. The shipments from Malaya during June were the second highest for the year in spite of the fact that not a single ton went to America. The highest monthly tonnage for the year was shipped to the U.K., and the Pacific area appeared for the first time as a large importer, whilst India and South America continued to take tonnages which can be considered above average.

On Thursday the official close on the tin market was: Settlement price £882 10s., Cash Buyers £882 10s., Sellers £885; Three months' Buyers £835, Sellers £837 10s. In the afternoon the market was steady. Turnover for the day was 140 tons. Approximate turnover for the week was 1,060 tons.

The Eastern price on Thursday morning was equivalent to £860 2s. 6d. per ton c.i.f. Europe.

Iron and Steel

The provision of increasing tonnages of steel for the re-armament programme, which is to be continued irrespective of the result of the "cease fire" negotiations in Korea, must of necessity involve some reduction in the supplies available for other purposes. Moreover, in the interests of a balanced economy steel exports are to be maintained at a fairly high level. Thus the British steel using industries have been warned that in the second half of the year their supplies will be on a reduced scale.

It is possible however that the cuts may be less severe than has been anticipated. Certainly the performance of the steel producers has exceeded expectations. In spite of increasing difficulties over raw materials they have raised both pig iron and steel production in June above the May level, and for the half year the ingot output has been at the rate of 16,306,000 tons per annum.

Of course there is bound to be a shrinkage this month and next. This is the usual consequence of the holidays which have already begun in Scotland. But the position in regard to raw materials is now somewhat easier. Imports of foreign ore are improving, production of home ironstone is on a rising scale, and the Federation hopes that the home scrap drive will produce an extra 500,000 tons by the end of the year.

All this should have a favourable effect on iron and steel production. The trouble is that requirements are increasing at a much more rapid rate. Defence orders are multiplying and these are to be given special priority. The Government moreover attach great importance to the maintenance of the export trade, so that the brunt of the cuts must fall upon home users of steel.

At the moment these industrialists are working in the dark. Hopes and fears alternate. They have no sure information regarding their future deliveries of steel and

prices too are still indeterminate. There is an unanswerable case for a steep advance.

The cost of production has enormously increased since prices were last reviewed in February last. All melting materials are dearer, wages have advanced, the increase in rail charges is estimated to have added 8s. per ton to the cost of steel production and the freights on foreign ore are now greater than the cost of the ore itself. Yet still the Minister of Supply has taken no overt action to balance the steel makers' budget. It is understood that private discussions on the subject are in progress and a steep price rise is regarded as inevitable.

Coal

The Ministry of Fuel and Power reports the output of coal for the week ended July 7 as 4,041,000 tons, as compared with 4,240,800 tons in the previous week. Distributed stocks for the week ended June 30 were 12,496,000 (12,117,000). The number of men on colliery books for the week ended June 30 was 701,500 (701,700).

JULY 12 PRICES

COPPER

Electrolytic ... £234 0 0 d/d

TIN

(See Metal Notes above for Thursday's Metal Exchange prices)

LEAD

Soft foreign, duty paid ... £160 0 0 d/d
Soft empire, including secondary lead ... £160 0 0 d/d
English lead ... £161 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid ... £160 0 0 d/d
G.O.B. spelter, domestic ... £160 0 0 d/d
Electrolytic and refined zinc ... £164 0 0 d/d

ANTIMONY

English (99%) delivered,
10 cwt. and over ... £390 per ton
Crude, (70%) ... £305 per ton

NICKEL

99.5% (home trade) ... £454 per ton

OTHER METALS

Aluminium, £124 per ton.
Bismuth, 25s. 9d. lb.
Cadmium, 18s. 3d. lb.
Chromium, 5s. 11d. lb.
Cobalt, 17s. 6d. lb.
Gold, 248s. f.o.z.
Iridium, £65 oz. nom.
Magnesium, 1s. 6d. - 2s. lb.
according to quantity.
Osmiridium, £35 oz. nom.
Osmium, £70 oz. nom.
Palladium, £8 10s. oz.
Palladium (scrap), £8 oz.
Platinum, £27/£33 5s. nom.
Rhodium, £45 oz.
Ruthenium, £30 oz.
Quicksilver, £73 10s./£74
ex-warehouse.
Selenium, 25s. nom. per lb.
Silver (bar), 78½d. f.o.z. spot
and forward.
Tellurium, 19s. lb.

ORES, ALLOYS, ETC.

Bismuth ... 50% 15s. lb. c.i.f.
40% 14s.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £11 per ton c.i.f.
" " (concentrates) £11 per ton c.i.f.
" " Refractory £10 12s. per ton c.i.f.
Baluchistan Metallurgical ... £11 11s. per ton c.i.f.
Magnesite, ground calcined ... £26 - £27 d/d
Magnesite, Raw ... £10 - £11 d/d
Manganese, Best Indian (Nominal)
Molybdenite (85% basis) (Nominal)
Wolfram (65%), U.K. 525s. 540s.
Tungsten Metal Powder 35s. 6d. nom. per lb. (home)
(for steel manufacture)
Ferro-tungsten ... 33s. 6d. nom. per lb. (home)
Carbide, 4-cwt. lots ... £30 3s. 9 d/d per ton
Ferro-manganese, home ... £37 19s. 10d. per ton
Ferro-manganese, export Nom.
Brass Wire ... 2s. 6½d.
Brass Tubes, solid drawn ... 2s. 0½d.

Mining Men and Matters

Mr. John Annan has been appointed a director of Oroville Dredging and of its subsidiary, The Pato Mines (Colombia).

The Hon. Lewis W. Douglas and Mr. I. C. Raymond Atkin have been elected directors of the International Nickel Company of Canada.

Mr. A. J. Ruthven Murray has been appointed managing director of Trinidad Leaseholds. Mr. E. J. C. Mardall has been appointed to the board as assistant managing director, and will continue to be the company's general manager in Trinidad, and Mr. H. D. Acres has been appointed to the board of the company as commercial director.

Simon-Carves have announced that they have signed a contract with the Great Lakes Carbon Corporation of New York for the building of a battery of 40 coke ovens at their works in St. Louis, Missouri. It is believed that this is the first coke oven contract ever obtained in the U.S. by a British firm.

The British Non-Ferrous Metals Federation at its recent annual meeting elected Mr. W. J. Terry as president for the year 1951/52. Mr. H. E. Jackson, Mr. H. C. Gibbins and Mr. W. F. Brazeren were elected vice-presidents, and Mr. A. L. Johnson was re-elected treasurer. The president will also act as chairman of the executive committee. The Council of the Federation is made up of the following associations: Brass & Copper Tube Association, Cold Rolled Brass & Copper Association, Extruded Brass & Copper Alloy Association, High Conductivity Copper Association, Manufactured Copper Association, Brass Wire Association, Zinc Rollers' Association, Nickel Silver Association, Non-Electrical Copper Association.

I.M.E. Dinner

In the course of their summer meeting held in Nottingham last week, the Institution of Mining Engineers gave a dinner at the University attended by over 250 members of the Institution and their guests. In proposing the toast of the Institution, The Rt. Hon. Philip Noel-Baker, Minister of Fuel and Power, said how grateful he was to Sir Andrew Bryan for accepting the invitation to join the National Coal Board as a full-time member. It was a great sacrifice for him and he had done it out of a sense of public duty. Sir Andrew could give leadership in our greatest industry such as would be invaluable to the nation. His long experience and skill as a man of the mines, and the immense respect with which he was regarded in every quarter of the industry would give him great authority from the start.

Speaking of the coal position, the Minister said that in the 'twenties the average internal consumption of coal was 167,000,000 tons a year; in the five years before the second war, the average was 175,000,000 tons, but in 1951, if the present rate of consumption continued until the end of the year, it would be 210,000,000. He emphasized that further improvements must still be made and that fuel economy of every kind in industry and in the home was an urgent public duty. He congratulated the Institution on a gain of over 400 in its membership (which now stood at 3,400) during the last three years.

SIR ANDREW BRYAN ON HEALTH IN MINES

Replying to the toast, Sir Andrew Bryan said that he would be leaving his present post of Chief Inspector of Mines with very great regret. He was deeply attached to the subject of health and safety in mines, and though he was being translated to another "house" he would never lose his interest in that problem. Questions of heat, dust, and humidity in mines were assuming greater importance because of the deeper mines now worked and the greater extent of mechanization. Mining accidents had been decreasing for some years, and while the necessity for safety must be urged as strongly as ever, problems of health were emerging which also required emphasis. More manpower was lost to the mines for health reasons than because of accidents. The problem was in the main an engineering one, that of bringing down the coal in such a way that the least possible dust was made initially, and of suppressing whatever dust was inevitably made.

The Institution was co-operating with the National Coal Board in its plans for the better education and training and the more use they made of the Universities and the more men they got from them the better it would be for the mining industry. There was a time in the past when the industry did not like University men at all; he thought it was realized now that there was a great mistake, and the sooner it was rectified the better.

The Mining Markets

(By Our Stock Exchange Correspondent)

The Gilt-edged market was rather hesitant last week. First came the news that the discount houses are stepping up the rates quoted by $\frac{1}{8}$ per cent for two, three and four months bills. All the principal banks are raising quotations for purchases of commercial bills, other than money market institutions, to keep in line with those quoted by discount houses. Market circles regard this as another logical step towards dearer money. Secondly, it was announced that the nationalized gas industry proposes to raise £75,000,000.

A new 3½ per cent stock dated 1969/71 is to be issued at 98 per cent. Market circles consider this issue "just right" without much margin, and doubts have been expressed whether the issue will be fully subscribed. It is presumed, however, that Government departments will take up any surplus stock with the idea of releasing it gradually on to the market as opportunity offers. Further issues may be expected if the market remains steady.

Kaffir shares had a dull week. Scattered selling and lack of interest made for generally lower prices. Closing of speculative positions in Orange Free State issues caused small declines. St. Helena's lower payability development figures for the June quarter disappointed the market, and the shares dropped 2s. Total development amounted to 10,066 ft. against 4,545 ft. for the March quarter. Of this, 2,330 ft. was sampled, returning only 23 per cent payability averaging 407 in.-dw. t.

The downward trend in diamond shares was sharply reversed by the record sales of £34,600,000 for the half-year. The excellent results for the second quarter (total sales £20,400,000 against £14,200,000 for the March quarter) brought about a sharp rally. This was checked

in some measure by profit-taking by professional operators.

As forecast last week base metal issues recovered from their recent setback. Buyers came in for copper shares, sustained by the satisfactory figures published by "Chartered" and by the knowledge that the price of the metal in the world's free markets is around £400 per ton compared with the official price of £234 per ton. This fact would appear to make any immediate price reductions by the United States most unlikely.

Lead/zinc issues also hardened following similar arguments for metal prices in this section.

Wankie Colliery shares jumped on the news that an E.C.A. loan of £5,000,000 has been granted to Northern and Southern Rhodesia. A part of this loan is to be used for improving railway facilities in the Colonies. Since transport difficulties have been one of the main production bottlenecks at the Wankie, this was rightly read as a bull point. Wankie's plan for doubling output to 5,000,000 tons in five years now appears capable of fruition. The colliery supplies large quantities of coal to the mines of the Rhodesian copperbelt. Research by Powell Duffryn, managers of the Wankie, is almost complete on the plan for extracting oil from coal. Market circles anticipate a favourable report, but no definite news is yet available. The construction of a water pipeline from the Zambezi to the company's property is almost finished. This has been described by the Managing Director as absolutely essential to the successful conduct of operations. The shares at one time touched 25s. but finished below the best. At this level the yield works out at about 3 per cent on the 7½ per cent dividend.

A firmer tendency was noticeable among West African producers towards the end of the week. Some buyers came in for leading shares in this long neglected market, and found dealers short of stock. Ashantis rose at one time to 28s. bid.

FINANCE	Price	+ or -		Price	+ or -		Price	+ or -		Price	+ or -		Price	+ or -		
	July 11	on week		July 11	on week		July 11	on week		July 11	on week		July 11	on week		
African & European	3 1/2	- 1/4	O.F.S.	12/6	- 1/4	G.F. Rhodesian	8/6	- 3d	TIN (Nigerian and Miscellaneous)	10 1/2	- 3d					
Anglo American Corp.	7 1/2	-	Blinkpool	23/9	- 1/3	London & Rhodesian	6/6	+ 1 1/2	Beralti Tin	26/-	+ 1 3/4					
Anglo Beach	32/9	-	Gold Mining F.S.	4/9	-	Motapa	2/9	-	Bischi	41/xd	- 4 1/2					
Anglo Transvaal Consol.	40/-	- 1 1/4	Freddie's	12/6	-	British	6/9	- 3/4	British	10 1/2	- 1 1/2					
Cam Bird	12/9	+ 3d	Freddie's N.	11 1/2	-	New Guinea	1/9	-	Ex-Lands Nigeria	7/xd	- 6d					
Central Mining (7 1/2 shrs.)	43/9	-	Freddie's S.	12 1/2	- 10 1/2	Nundydroog	7/9	-	Geovir Tin	16/6	+ 3d					
Consolidated Goldfields	5 1/2	-	Geoffrey	3/4	-	Oreogum	3/3	-	Gold & Base Metal	37 1/2 xd	- 4 1/2					
Consol. Mines Selection	35 1/2	- 7 1/2	G.O. Gold	2/3	-	Orville	1/9	-	Jamaica	6 1/2	- 1 1/2					
East Rand Consols	4/3	-	Harmony	24/-	- 9d	St. John d'E Rey	37/6	+ 1/3	Jos Tin Area	11/3	-					
General Mining	37/6 xd	-	Lundenburg Estates	11/3	- 3d	Zams	3/3	-	Kaduna Prospectors	4/-	- 4d					
H. E. Prop.	9/8	- 1/4	Ofista	2/3	- 1 1/2	London Tin	3/3	-	Kaduna Syndicate	6/-	- 3d					
Henderson & Transvaal	9/8 xd	-	President Brand	23/9	-	Anglo American Inv.	4xd	+ 1/2	Rhion Valley	5/1 1/2	+ 4 1/2					
Iohannes	4/7	-	President Steya	17/3	-	Casts	37/-	+ 1/2	United Tin	2/7 1/2	-					
Rand Mines	40 1/2	- 1 1/2	St. Helena	30/9	- 1 10/11	Cons. Diam. of S.W.A.	34/-	-								
Rand Sel.	7/7	-	U.F.S.C. & G.	80/-	- 3d	De Beers Ltd. Beers	7/9	+ 1/3								
Imperial Corporation	4/7	-	Virginia Deb.	14/-	- 9d	De Beers Pld. Beers	17/-	-	SILVER, LEAD, ZINC							
Vereniging Estates	6 1/2	+ 6d	Virginia Ord.	73/9	-				Broken Hill South	54/6	+ 2 1/2					
Writs	32/6	- 6d	Welkom	38/9	- 2 1/2	COPPER			Burns Corporation	47/-	+ 1 1/2					
West Wits.	2 1/2	- 1/4				Western	68/9	+ 1 1/2	Chartered	38/9	-					
			WEST AFRICAN GOLD			Indian Copper	4/6	- 3d	Mining Trust	5 1/4	- 1 1/2					
			Amalgamated Banket.	2/4	- 1 1/2	Messina	4 1/2	+ 1/2	Mount Isa	4 1/2	+ 9d					
			Ariston	7 1/2	-	Nchanga	38/3	- 1/3	New Broken Hill	25/9	-					
			Ashanti	27/6	- 6d	Rhodo. Anglo-American	38/3	- 1/3	North Broken Hill	72/3	+ 3d					
			Bibiani	10/11	-	Rhodesian Selection	38/-	+ 1 1/2	Rhodesian Broken Hill	19/9	+ 1 1/2					
			Brenang	3/3 to 4	-	Rhokana	20/-	+ 1/2	San Francisco Mines	32/6	+ 1 10/11					
			G.C. Main Reef	3/6	- 1 1/2	Rio Tinto	20/-	-	Trepca	41/-	+ 3d					
			G.C. Selection Trust	9/6	- 3d	Roan Antelope	19 1/2	+ 9d								
			Konongo	17/3	- 1 1/2	Selection Trust	47/-	-								
			Kribbi	4/-	-	Thanks	17/-	-								
			London & African Mng.	21/1	-	Tankis Sulphur Br.	48/9	-	MICELLANEOUS							
			Lyndhurst Deep	2/4	-	TIN (Eastern)			Associated Manganese	63 1/2	+ 6d					
			Marlu	21/1	-	Anglo-Burma	3/3	-	Chinese Engineering	2/9	- 6d					
			Maru	10 1/2	-	Ayer Hittam	27/9	-	C.P. Manganese	53 1/2	- 6d					
			Maquab & Abosso	7/-	- 1 1/2	Bangor	31/10 xd	- 7 1/2	Natal Navigation	5/-	-					
						Goepeng	13/3	-	Wankie	24/3	+ 1 1/2					
			AUSTRALIAN GOLD			Hongkong	11/3	-	Witbank Colliery	4 1/2	-					
			Boulder Perseverance	3/-	- 1 1/2	Ipoeh	28/1 1/2	-	CANADIAN MINES							
			Gold Mines of Kalgoorlie	16/4	- 1 1/2	Kamunting	12/6	- 3d	Dome	32 1/2	+ 1					
			Great Boulder Prop.	21/9	- 3d	Shanghae Drilling	11 1/2	+ 4 1/2	Hudson Bay	11 1/2	- 1					
			Klaarwater Western Consol.	20/9	-	Kinta Tin Mines	15/7 1/2	+ 7 1/2	International Nickel	37 1/2	+ 1 1/2					
			Laurel View and Star	20/9	-	Kramat Pulai	4/4	-	Mining Corp. of Canada	68 1/2	+ 1					
			Mount Morgan	20/-	- 3d	Malamat Dredging	23/9 xd	-	Noranda	3135	- 3					
			North Kalgoorlie	18/6	- 3d	Palmag	10/10 1/2	-	Oreomont	68 1/2	- 1					
			Palmag	9d	-	Pengkalen	12/6	-	OIL							
			Sons of Goldfield	12/6	-	Petaling	12/3	-	Anglo-Iranian	5 1/2 xd	- 1/4					
			Sons Kalgoorlie	10/- xd	+ 4 1/2	Rambutan	22/-	-	Apex	50/-	-					
			Western Mining	7/10	+ 1/3	Southern Kinta	17/3 xd	-	Attock	28 1/2	- 1 10/11					
			Wiluna	11/3	- 1 1/2	S. Malayan	28/6 xd	-	Burns	61/10 1/2	- 1 10/11					
			MICELLANEOUS GOLD			S. Trochod	22/3	-	Canadian Eagle Beers	104/-	- 1 1/2					
			Cam and Motor	32/6	+ 7 1/2	Sungai Kinta	17/9 xd	-	Michigan Eagle	23 1/2	+ 3d					
			Champion Reef	9/6	-	T. D. Tinspring	28/3	- 3d	Shell	4 1/2	-					
			W. M. Tinspring	11/3	-	Trochod	28/3	- 3d	Trinidad Leasehold	28/9	-					
			Globe & Phoenix	23/-	-				Ultramar	35 1 1/2	+ 4 1/2					

Company News & Views

Record Diamond Sales

Sales of diamonds were on a record scale during the quarter ended June 30 last. De Beers Consolidated Mines have announced that the sales of diamonds, both gem and industrial, effected through the Central Selling Organisation on behalf of South African and other producers advanced to £20,412,227 compared with £14,184,048 in the previous quarter.

The following table shows sales of both gem and industrial diamonds during the first two quarters of the current year compared with the corresponding quarters in 1950.

Period	Gem Diamonds	Industrial Diamonds	Totals
March Qtr. 1950	£10,486,078	£2,114,107	£12,600,185
March Qtr. 1951	£11,296,231	£2,887,717	£14,184,048
June Qtr. 1950	£6,744,765	£2,471,333	£9,216,098
June Qtr. 1951	£14,190,251	£6,221,976	£20,412,227
Total sales for the six months ended June 30, 1950	£21,816,283
Total sales for the six months ended June 30, 1951	£34,596,275

Of particular interest is the increased demand for industrial stones over the first quarter, which was considerably below the sales effected during the last quarter of 1950 of £5,495,475. Demand for gems has been exceptionally strong for the past year, apart from the June quarter of 1950 when sales fell to £6,744,765. Total turnover of both qualities during 1950 of £50,967,041, was the highest total business ever recorded in the diamond industry, but as the table illustrates, if present demand is maintained this record will be comfortably surpassed.

It is impossible at this stage to say whether there were any special factors influencing the last quarter's demand, but there cannot be any doubt that the recent price advance of 15 per cent which became operative last March has materially assisted in the present advance in sales.

In any case the current figures will quickly banish to the limbo the statement recently made by Sir Ernest Oppenheimer to De Beers shareholders that quieter times may lie ahead.

Outlook for "Chartered"—Bullish

Consolidated profit of The British South Africa Co. ("Chartered") to September 30, 1950 was £3,721,158, an increase of £399,600 over the previous year's earnings of £3,321,558. After making provision of £82,024 (£22,530) for depreciation, and paying out £2,082,156 (£1,827,119) for taxation, but crediting the sum of £83,062 arising from adjustments in respect of previous years, consolidated net profit was £1,473,916 compared with £1,479,155. Of this amount the parent company's net profit amounted to £1,460,742 compared with £1,458,778. As previously announced, the company has maintained its dividend at 33½ per cent, which required £1,204,569, leaving the carry forward higher at £2,097,201 against £1,841,028 previously.

Although the gross revenue of "Chartered" was up from £3,408,110 to £3,832,219, there will be many who had hoped that this figure would have been much higher, particularly so as the greater part of the company's revenue is derived from royalties geared directly to the price of copper. But it must be remembered that the accounts have been delayed to meet the requirements of the Companies Act, and only cover operations to a date when the average price for copper had not been above £200. In fact, it was only in September, 1950, that the copper price reached £202 per ton, and for the purpose of calculating the com-

pany's royalties during the year the average value per ton of copper was taken at £137.49 per ton. There are, therefore, good grounds for believing that the current year's accounts will show a big improvement. The average price for copper to date is nearly £210 per ton, while additionally, revenue from the company's investments in the Northern Rhodesian copper producers, which have already declared higher payments, should also show a big improvement.

An important point that should not be forgotten when looking at the accounts for the period under review is that they take into consideration for the first time, the company's payment of 20 per cent of its net revenue from its mineral rights to the Northern Rhodesian Government for which it became liable under the 1949 agreement.

H.E. Prop's Diversified Interests

H.E. Proprietary, the mining finance company, has widespread gold mining interests in companies in South Africa, Australia, New Zealand and Canada. In South Africa its principal assets, apart from its large interest in Luipaards Vlei, are merged in its wholly owned subsidiary, the South African H.E. Proprietary, which is managed in South Africa by the Anglo Transvaal Consolidated Investment Co. In Australia and New Zealand, interests and participations are held in several undertakings including Wiluna Gold, Gold Fields Australian Development, Golden Horsehoe (New), Blackwater Mines and the Consolidated Gold Fields of New Zealand while in Canada, the company's interests are centred in Anglo Huronian.

Group profit for the year ended December 31, 1950, before taxation, but after charging depreciation, amounted to £203,852. Taxation took £115,911 and after deducting amounts due to minority interests the net profit of the group was £56,317 compared with £49,966 previously. Total distribution was maintained at 30 per cent and consisted of a 5 per cent interim dividend with a final of 15 per cent and a bonus of 10 per cent. These dividends and bonus absorbed £47,625 and after transferring £50,000 (nil) to general reserve, the forward balance was reduced to £75,722 against £116,055 previously.

Bremang Gold's Increased Profits

The report and accounts of Bremang Gold Dredging for the year 1950 shows clearly how the benefits derived from devaluation have been largely nullified by rising costs of labour and raw materials. On the one hand, although gold production totalling 37,916 f.oz. gold was 690 f.oz. less than the previous year, bullion proceeds showed an increase of £81,143 to £471,038. On the other hand, mine operating costs were up by £71,843 at £292,848. Dredge costs increased by almost 30 per cent over the previous year, and the average working cost per cubic yard was higher by 1.76d. at 8.07d., and this in spite of the company's four dredges treating a total of 8,707,130 cu. yd., an increase of 305,820 cu. yd. over the previous year, though the grade, 2.29 grains per cu. yd., was lower by 0.12 grains.

The improved earnings brought a higher gold duty levy payable to the Gold Coast Government which totalled £28,379, equivalent to 15s. per oz. of gold produced. This compares with the levy paid last year of £5,115, equal to 2s. 7.75d. per oz. Taxation was slightly lower at £63,725 against £70,277, and net profit for the year was £55,910 compared with £45,288 previously. The dividend of 4½d. per 5s. unit of stock was paid on the recently increased capital, which now amounts to £1,054,212, absorbing £41,509 (against 10 per cent and a bonus of 5 per cent paid in 1949 on an issued capital of £962,562 which took £52,941) leaving the forward balance higher by £14,401 at £24,819.

As previously announced, the company during the current year has taken over from the Gold Coast Selection

Trust, areas on the Offin and Jimi Rivers, which are estimated to contain over 175,000,000 cu. yd. of dredgeable alluvial deposits averaging over 2.6 grains per cu. yd.

For the first five months of the current year, 3,699,000 cu. yd. were dredged yielding 16,775 oz. of gold, giving an operating profit of £90,564. It is interesting to note that during this period average costs per cu. yd. fell to 7.61d., but it pointed out in the consulting engineer's report that these costs will undoubtedly increase during the remaining seven months, as no major overhauls had been undertaken up to the end of that time. The first dredge to undergo a major overhaul is now in hand.

The ore reserves of the Ankobra River Areas at the end of 1950 were recorded as 37,948,500 cu. yd., averaging 3.14 grains per cu. yd.

Sons of Gwalia's Good Results

Neither the acute shortage of labour nor the rise in working costs (including development) by 5s. 6d. to 48s. 10d. per ton prevented Sons of Gwalia, the Westralian gold producer, from doubling its dividend to 2s. per share, or 10 per cent, for the year 1950. Devaluation has, of course, materially assisted the company in taking these difficulties in its stride, but the company shares a large part of the credit for this very satisfactory result. Tonnage crushed was up by more than 10 per cent to 101,112 tons yielding 25,628 f.oz. gold compared with 91,399 tons yielding 23,572 f.oz. gold. Profits from the year's operations amounted to £62,653 compared with £27,909. Taxation took £35,000 (£8,000) and the 10 per cent dividend absorbed £17,063, leaving the forward balance higher at £26,786 compared with £21,158 previously.

Although the ore reserves have fallen from 602,224 tons averaging 5.55 dwt. to 593,530 tons averaging 5.54 dwt., their average value is still above the grade of ore sent to the mill during the period under review, which averaged 5.1 dwt. per ton. Development footage advanced during the year totalling 1,548 ft. was a big improvement on the 556 ft. developed previously and some good values were disclosed on opening up the new lodes in the hanging wall of the main lode, between levels 27 and 31. But the extensive diamond drilling carried out during the year failed to locate any new gold deposits of importance.

Bisichi Tin Pays 20 Per Cent

Higher outputs of both tin (450 tons against 414 tons), and columbite (130 tons against 79 tons), and rising metal prices are chiefly responsible for the revenue received by the Bisichi Tin Co. (Nigeria) for its output for 1950 of £415,503, being approximately double the previous year's earnings of £204,130. However, mining costs at £154,982 exceeded the previous year's figure by some £64,000, and after this and other expenses including taxation liabilities amounting to £97,170 (of which £56,000 has been transferred to reserve for future taxation) were provided for, net profit for the year figured at £79,552 against £30,196 previously. Dividend payments totalled 20 per cent (15 per cent), absorbing £48,875, leaving the carry forward substantially higher at £33,854, compared with £3,177 at the end of the preceding year.

The current year's operations are proceeding satisfactorily. Output during the first five months totalled 298 tons of tin and 71 tons of columbite, an increase of 135 tons tin and 2 tons columbite compared with the corresponding period of last year. However, the tin royalty payable to the Nigerian Government has been increased to £128 per ton for the first quarter of the current year, and will rise to £154 per ton for the second quarter. This levy averaged £81 per ton during 1950 and £43 per ton in 1949. Nevertheless, operations during the current year have been considered satisfactory enough to warrant the payment of an interim dividend of 3d. per share less tax.

Prospecting drilling carried out during the year resulted in 411 tons of tin and 103 tons of columbite being added to the 1950 year-end reserves, which at that date stood at 4,859 tons of tin and 840 tons of columbite.

Puket Tin—Eight Months' Work

The facts and figures contained in the report and accounts of Puket Tin Dredging for the calendar year 1950 cannot be compared with those contained in the previous year's report. This is so because the company's dredge was occupied for four months in moving from its eastern to its western leases, and tin ore recovered during this time was on account of Katu Tin Dredging and all statistical figures in respect of this period have been eliminated from the annual report.

Notwithstanding the fact that the company's mining operations reflect only eight months work compared with a previous full year, the higher price received for tin during the year under review enabled the company to sell its output of 344.18 tons (583.27 tons) for £160,711 as against £168,242 in 1949. Working profit for the year amounted to £87,579 (£100,034), and after providing £46,672 for taxation, net profit figured at £41,236 compared with £17,644 previously. From the £53,946 available, dividend distributions aggregating 9d. per 5s. share (6d.) absorbed £20,625. The sum of £13,000 was written off property account, leaving a balance of £20,321 to be carried forward, compared with £12,710 in 1949.

During the current year the company's War Damage Award was settled at £33,767. This amount exceeds the amount expended to the end of 1950 on rehabilitation by £5,269, and this surplus has been credited to rehabilitation reserves account and appears in the balance sheet among revenue reserves.

Ex-Lands Pays More

Tin revenue of Ex-Lands Nigeria for 1950 from the sale of 712 tons tin concentrates totalled £491,026 which compares with the previous year's yield of £304,760 from the sale of 725 tons tin concentrates, an increase of £186,266. The increase in the average price received per ton tin metal by approximately £360 to £930 per ton not only offset the small decline in output but also absorbed the rise in production costs of £18 per ton to £169 per ton, the heavier tin realization charges, the 50 per cent increase in the Royalty payable to the Nigerian Government which represented £63 per ton, and taxation charges which soared to £150,000 against £71,300. The final outcome was that net profit amounted to £113,202 compared with £57,338. Dividend payments were stepped up to 50 per cent (30 per cent) and the remainder was carried forward bringing the total balance of profit unappropriated to £99,957 against £40,255.

Production for the first five months of the current year was 263 tons or 82 tons less than for the corresponding period last year. No one explanation can be held to account for this decline but as the company's output varies considerably from month to month not too much importance at this stage should be attached to the lower output. On the other hand, output must be maintained to cope with the rise in costs during the current year in the shape of higher African wages, increased freight and ocean rates as well as a larger percentage royalty payable to the Nigerian Government.

Potentially valuable in the long run is the company's interest in Mines Development Syndicate (West Africa) whose property the American Smelting and Refining Co. of New York are exploring extensively and findings to date indicate "the possibility of establishing a lead-zinc operation of substantial size."

Ore reserves as at December 31, 1950, after allowing or the 712 tons produced during the year, totalled 4,658 tons, an increase of 76 tons over the previous year.

Gold and Base Metal Mines Distribute 15 per cent

Output of tin concentrates during 1950 from Gold & Base Metal Mines of Nigeria at 553 tons was 83 tons less than that produced in the previous year, and transport costs both f.o.r. and f.a.s. Port Harcourt continued to rise. However, these adverse factors were more than offset by the higher average price received per ton tin concentrate which advanced £295 to £713 per ton (or £970 per ton metal) with the net result that tin revenue increased by £130,201 to £397,832. The greatly improved earnings attracted a much higher tax, £84,018 against £18,791, after this and all other expenses had been met net profit for the year amounted to £71,099 compared with £20,443 in 1949. The dividend distribution of 15 per cent (5 per cent) absorbed £27,562, leaving the forward balance more than doubled at £106,850, compared with £51,419 previously.

Mr. O. V. G. Hoare, chairman, informs shareholders in his review accompanying the report and accounts that the company is using the additional revenue received to accelerate further mechanization and modernization of existing equipment, the effects of which it is hoped will become apparent towards the end of the current year. This is good news for it will help to counter the increased royalty charges imposed by the Nigerian Government which have been increased to a maximum of 17 per cent (10 per cent) of the gross receipts when the tin price is £1,000 or over. In practice this levy works out at a somewhat higher figure as it is calculated on the London spot quotations, whereas the normal contract for the sale of the company's concentrates gives a price based on the three months quotation, which, in recent months, has been at times more than £100 less than the spot price.

Output for the current year, the chairman said, showed some improvement over the corresponding period last year and it is expected that a further 300 tons of concentrates at least will be produced in the remaining six months of the year.

During the year the company's remaining shareholdings in Bisichi Tin Co. (Nigeria), and in United Tin Areas, were realized. Thus its investments at July 9, 1951, were represented by its shareholding in Mines Development Syndicate (West Africa) at a book value of £58,220, which includes a loan of £35,000 which has recently been converted into shares in the Syndicate at par. The company, like Ex-Lands Nigeria, is in the Finsbury Pavement House group and is also participating in the arrangement between the Syndicate and the American Smelting & Refining Co. of New York whereby the latter company is extensively exploring the Syndicate's property with a view to establishing a lead-zinc operation of substantial size.

Ore reserves at the end of 1950 totalled 7,341 tons composed of 5,412 tons proved having an average value of 0.96 lb./yd., and of 2,199 tons probable having an average value of 0.77 lb./yd.

Lobitos Oil Profit Expansion

The consolidated profit of Lobitos Oilfields for 1950 advanced by £354,749 to £910,679. This impressive profit expansion was obtained after making larger provisions for depreciation, for tankers' survey repairs, for development expenditure in Peru and for meeting Peruvian tax liabilities of £287,705 against £317,415 in 1949. Capital profits of £105,347 received from the realization of investments and the sale of a tanker swelled revenue to £1,016,026 but after charging U.K. taxation amounting to £442,743 (£250,114) net profit figured at £573,283 compared with £305,562 previously.

Following the 5 per cent interim paid in February last, the company is paying a final of 10 per cent and a bonus of 7½ per cent, bringing the year's distribution to 22½ per cent compared with 17½ per cent previously.

Rand Mine Returns for June

The first half of the year wound up with the June returns of the Rand mines making a disappointing showing. Revenue and costs were adversely affected by retrospective payments due for period Jan. 1 to June 30, through an increase in rates of pay granted to some classes of employees. Without exception, profits of all the mines were lower, while only one worked at the same figure of costs as in the previous month; in all the others working expenses were higher. Tonnage milled was lower owing to the shorter month in the case of all but six mines, two of which dealt with the same amount of ore and four an increase.

In the "Corner House" group, Crown Mines showed the biggest drop in profit of £32,680, Blyvoor's was £30,900 less and East Rand Props. £29,200. The best showing was made by Rose Deep which milled 2,000 tons more for the same figure of costs, 30s. 1d., while profit was only £340 less than in May.

Sub Nigel's profit drop of £10,600 was the severest of any of the Gold Fields members; it resulted from a lower tonnage and increase of 1s. 7d. per ton in working costs. Lower tonnage and increase of 1s. 6d. in costs were also responsible for a set-back of £6,740 in Libanon's profit. That of Robinson Deep was less than half the £15,128 shown as a result of the May crushing.

Three mines of the Anglo American group—Springs, "Sallies" and Western Reefs dealt with larger tonnages, while Brakpan put through the same amount of ore as in the previous month. Daggafontein's output was not so severely disturbed as was expected in consequence of the fire that broke out during the month in a haulage No. 3 shaft. Milling was 9,000 tons less and profit dropped by £31,470.

Tonnage and profit returns of all the members of the Union Corporation were normally lower having regard to the shorter month, while there was no conspicuous rise in costs. Grootvlei showed the biggest drop in profit of £14,400 and Marievale the largest rise of 1s. per ton in costs.

All the members of the "Johnnies" group announced a lower scale of operations. Randfontein's profit was £11,900 down as a result of a lower tonnage and rise of 1s. 9d. per ton in costs. The profit of Government Areas was nearly £10,000 down and that of New State Areas compared with £2,421 in May.

Lower tonnage and increase in costs resulted in West Rand's profit being £12,716 lower, while for a similar reason Rand Leases profit dropped by £5,390 and costs rose 1s. per ton to 33s. 3d.

The June returns for the Rand Mine producers are given below:

Blyvoor.—103,000 tons yielded 68,497 oz.; profit £619,598.
Brakpan.—117,000 tons yielded 21,941 oz.; profit £54,477.
City Deep.—161,000 tons yielded 32,565 oz.; profit £53,167.
Consol M.R.—190,000 tons yielded 25,631 oz.; profit £46,191.
Crown.—276,000 tons yielded 46,712 oz.; profit £75,264.
Daggafontein.—228,000 tons yielded 56,317 oz.; profit £412,455.
Durban Roodepoort.—182,000 tons yielded 30,897 oz.; profit £95,002.
East Champ D'or.—33,000 tons yielded £61,134; profit £9,579.
East Dagg.—100,000 tons yielded 18,322 oz.; profit £78,977.
East Geduld.—149,000 tons yielded 44,703 oz.; profit £366,503.
E. Rand Prop.—223,000 tons yielded 45,400 oz.; profit £169,781.
Geduld.—105,000 tons yielded 15,496 oz.; profit £42,623.
Govt. Areas.—234,000 tons yielded £394,262; profit £50,742.
Grootvlei.—197,000 tons yielded 44,030 oz.; profit £292,350.
Libanon.—85,000 tons yielded £15,743 oz.; profit £45,002.
Luipaards Vlei.—102,000 tons yielded 19,054 oz.; profit £58,068.
Marievale.—61,000 tons yielded 15,124 oz.; profit £73,212.

Modder "B."—53,000 tons yielded 6,382 oz.; profit £8,028.
Modder East.—123,000 tons yielded 14,110 oz.; profit £37,411.
New Kleinfontein.—109,000 tons yielded 14,124 oz.; profit £39,761.
New Modder.—22,500 tons yielded 2,731 oz.; profit £1,053, special profit declaration, £24,825 from 2,000 oz., result of clean-up operations.
New State.—61,000 tons yielded £94,739; profit £326.
Nigel.—36,500 tons yielded 4,929 oz.; profit £2,200.
Randfontein.—352,000 tons yielded £529,652; profit £38,079.
Rietfontein.—27,000 tons yielded 6,008 oz.; profit £30,248.
Robinson.—116,000 tons yielded 17,934 oz.; profit £7,086.
Rose Deep.—86,000 tons yielded 11,998 oz.; profit £20,093.
Simmer & Jack.—129,000 tons yielded 20,516 oz.; profit £26,959.
S.A. Lands.—116,000 tons yielded 20,380 oz.; profit £77,608.
South Roodepoort.—27,500 tons yielded 6,065 oz.; profit £23,407.
Spaarwater.—10,500 tons yielded 2,471 oz.
Springs.—170,000 tons yielded 21,983 oz.; profit £27,582.
Sub Nigel.—66,500 tons yielded 23,774 oz.; profit £137,173.
Van Dyk.—100,000 tons yielded 15,395 oz.; profit £17,486.
Venterspost.—103,000 tons yielded 21,888 oz.; profit £78,074.
Vlakfontein.—38,000 tons yielded 14,108 oz.; profit £81,607.
Vogelstruiskult.—78,000 tons yielded 19,675 oz.; profit £83,866.
Weigedacht.—33,000 tons yielded 3,825 oz.; profit £3,232.
West Rand Cons.—218,000 tons yielded 34,871 oz.; profit £160,442.
Western Reefs.—104,000 tons yielded 22,997 oz.; profit £111,942.
Wit. Gold.—60,000 tons yielded £86,018; profit £428.
Wit. Nigel.—10,000 tons yielded £32,349; profit £1,294.

Company Shorts

Freddie's Deepen Borehole.—Free State Development & Investment Corporation have announced that Borehole PPI on farm Philippi No. 895 which was stopped in September, 1946, has now been deepened for the joint account of Freddie's and Freddie's North.

The conglomerate, which is considered to be in the Elsberg series, has been intersected at a depth of 4,658 ft. assaying 9.65 dwt. over 30.5 in., equivalent to 294 in.-dwt. Recovery of core was incomplete. The borehole is being continued and a deflection to re-intersect this reef will be made at a later date.

Naraguta Karama Areas.—A preliminary announcement of the results of Naraguta Karama Areas for 1950 discloses that tin ore production amounted to 154.5 tons against 162.25 tons. Profit for the year, after charging depreciation, etc., improved to £41,801 against £9,275. Taxation was heavier, £23,350 (£5,050), the sum of £11,500 (£1,500) was placed to reserves, and after distributing 9 per cent against 5 per cent, there remained £4,025 to be carried forward compared with £2,006 in 1949.

The company has declared an interim dividend in respect of the current year of 3½ per cent less tax. The meeting will be held on August 21.

Naraguta Extended Areas.—A preliminary announcement of the results of Naraguta Extended Areas for 1950 show that tin ore production amounted to 136 tons, or 33 tons less than that produced in 1949. But profit for the year was better by nearly £14,000 at £40,316 (£26,659). Taxation was higher at £23,350 (£14,500). £9,530 (£6,000) was placed to reserves and after distributing 9½ per cent (8 per cent), the forward balance was slightly higher at £2,888 against £2,107 previously.

The company has declared an interim dividend in respect of the current year of 6 per cent less tax. The meeting will be held on August 21.

South Bukuru Areas.—Preliminary announcements of the results of South Bukuru Areas for 1950, reveal that production of tin ore declined to 62½ tons against 75½ tons in 1949, but that the output of columbite containing concentrate was 8 tons against 5 tons previously. Profit for the year was £14,750 against £6,922, and taxation took £8,400 (£3,675). The sum of £3,500 (£1,500) was placed to reserves, and dividends totalled 12½ per cent (10 per cent), leaving the carry forward higher at £2,808 compared with £1,998 previously.

An interim dividend of 5½ per cent less tax has been declared in respect of the current year. The meeting will be held on August 21.

Topical News in Brief

New Argentine Coal Railway Opened.—The new Argentine State Railway line from the port of Rio Gallegos to the coal mines of Rio Turbio in the Southern Territory of Santa Cruz (Patagonia) was formally inaugurated on May 25. The coal mines have been re-named Presidente Perón.

U.S. Metallurgical Expert for Israel.—A metallurgical engineer of the U.S. Bureau of Mines is reported to have arrived in Israel recently to determine the feasibility of mineral resource development projects, including research on bituminous limestone and the establishment of an ore dressing laboratory.

Prospecting in Italian Somaliland.—Prospecting rights have been granted to the Compagnia Mineraria Etiopica (COMINA) in the Bender Ziada area of Italian Somaliland, states the official bulletin issued by the Italian Trusteeship Administration. The company is authorized to seek tin, tungsten, molybdenum, zirconium and rutile in an area covering 239 sq. kilometres for two years from December 4, 1950.

Mineral Production in Egypt.—According to *The Egyptian Gazette*, output of phosphates amounted last year to 500,000 tonnes as compared with only 40,000 tonnes in 1937 and over 300,000 tonnes between 1947-49. Manganese output totalled 150,000 tonnes in 1950, against an annual average, before 1950, of 80,000 tonnes. Value of the total output of Egypt's mines was £E.2,250,000 in 1950.

Iron-Ore Deposits Discovered in Brazil.—Iron-ore deposits estimated at many millions of tons with a high percentage Fe-content have been discovered recently in the valley of the river Ribeira in the south of Sao Paulo, states the *Fortnightly Review* of the Bank of London and South America. If these deposits could be exploited, they would make the State of Sao Paulo independent of iron-ore supplies from Minas Gerais, which State controls at present supplies of this commodity.

Widnes Site for Anhydrite-based Sulphuric Acid Plant.—United Sulphuric Acid Corporation, formed earlier this year to erect a plant, costing about £3,500,000, for the manufacture of sulphuric acid from anhydrite, is, according to its chairman, Mr. F. D. C. Fison, negotiating for the acquisition of a site at Widnes. Simon Carves Ltd. has been appointed main contractor for this plant, according to an announcement made by Lord Simon of Wythenshawe, the company's governing director.

Belgian Plastic Pipes to Replace Lead Pipes.—Pipes made of a plastic material, ten times lighter than lead pipes, are now being manufactured in Belgium by the chemical concern, "Société d'Arendancy" of Arendonk, Antwerp Province, states Reuter's Brussels Correspondent. The piping is said to be impervious to chemicals except mineral oil, does not burst during cold spells and can be attached to any other type of piping. However, it cannot stand up to temperatures above 55°C. The cost of these pipes is stated to be 40 to 50 per cent less than that of lead pipes.

New British Tunnelling Record.—A new British tunnelling record was established during the week ended June 10, when tunnellers working 8 hour shifts round the clock for seven days drove a distance of 427 ft. through hard diorite rock, forming the mountains of the Cobler Range. The tunnel, which is approximately 7 ft. square and will eventually be some 6,000 ft. long, is one of many being constructed by Edmund Nuttall, Sons & Co. (London) Ltd., forms part of the Loch Sloy Hydro-Electric Scheme and will carry water from above the Rest-and-be-Thankful summit to the Loch Sloy Reservoir. This is the first time that a footage of over 400 ft. has ever been recorded in this country and it is also believed to be a European record for projects of a similar nature.

Mechanization of Coal Loading in Poland.—According to reports from Poland, 6 per cent of the underground loading is now mechanized. This is stated to have been achieved with the help of machinery supplied by the U.S.S.R. Next year, the first series of "duck's beak" loading machines and other coal winning equipment, made according to Soviet Russian blue-prints, will be produced in Poland. Thus, the percentage of coal loaded mechanically will rise to 15 per cent. Moreover, as a result of the planned increase in the output of mining machinery, and the application of new working methods, this figure is to be increased to 65 per cent in the last year of the current Six Year Plan. In many collieries, miners are reported to have mastered the technique of servicing this machinery, but it is revealed that in others, they have not yet learned how to make full use of it. To remedy this, special "shock brigades" of instructors have been sent to mines where output has remained low in spite of newly installed machinery.

THE BURMAH OIL CO., LTD.

The Forty-ninth Annual General Meeting of the members of The Burmah Oil Company, Limited, was held on Friday, 6th July, 1951, in the Merchants' Hall, 30 George Square, Glasgow.

Sir Kenneth B. Harper, Chairman and Managing Director, presided.

The following Statement by the Chairman was circulated with the Directors' Report and Accounts:—

The Consolidated Profit and Loss Account discloses a Group trading profit for 1950 of £6,837,831 being £1,220,532 higher than that of last year. A number of factors have contributed to this satisfactory result. There was in 1950 some improvement in the general level of petroleum product values over that of the previous twelve months and trade continued to expand in India, Pakistan and Burma. Again, whilst our Subsidiaries have maintained their exploration activities during the past year, expenditure in 1950 was below that of 1949 when heavy outlays were incurred on equipment required in connection with these operations.

To the figure of trading profit of £6,837,831 is added an income from Interest and Dividends amounting this year to £2,943,989, which, with £1,003 from Transfer Fees, brings total income from all sources to £9,782,823 from which falls to be deducted Directors' emoluments and Auditors' Fees £36,401, Depreciation £855,616 and Taxation £5,999,348 leaving £2,891,458. After adding £547,851 brought forward the amount finally available for disposal is £3,439,309. Out of this sum the Board has allocated £1,203,332 to General Reserve and, if their recommendation of a Final Dividend of 12½ per cent and a Cash Bonus of 6 per cent is approved, net Preference and Ordinary Dividends and bonus will absorb £1,688,036, leaving £547,941 to be carried forward. While this increased distribution is more than amply covered by earnings, Stockholders will notice that it is given in the form not of dividend but of cash bonus, in accordance with pre-war practice. It carries no implication that it will be repeated in future years.

I think you will find that the Balance Sheets of both the Company and the Group with the accompanying notes set out clearly the financial position, but I would like to add a few general comments.

The arrangements between our Burma operating Subsidiaries and our friends The Indo-Burma Petroleum Co. Ltd. and The British Burmah Petroleum Co. Ltd. for joint operation of developing, producing and refining crude oil in Burma, with consequent financial adjustment between the Parties arising therefrom, enable us this year to delete the now rather unrealistic Balance Sheet headings of "Assets in Burma at date of Denial" and "Rehabilitation Suspense Account." Under these arrangements our Burma operating Subsidiaries' share of what it has been possible to salvage out of the former, together with the final cost of assets represented by the latter, have been transferred to "Concessions, Oil Wells, Buildings, &c." The consequent write-off of the book values of the final assessment of losses in Burma amounted to £1,460,262 and this, as you will observe from the relative note attached to the Accounts, has been met out of General Reserve. This compares with a book value of £3,400,000, which you will remember was set aside as a provision against this write-off out of available reserves in 1941 but returned to General Reserve in 1948. The effect on our General Reserve balance, after adding the Board's allocation of £1,203,332 out of this year's profits and transferring £256,930 from the Parent Company's Fire and Marine Insurance Reserve now no longer required (because the assets affected are now all held by the operating Subsidiaries), is to leave it at £12,850,000, unchanged from last year. In all the circumstances I think you will agree this can be considered satisfactory.

This year, in addition to the Reserves which have been built up out of the Group's operations, we have a new item under Capital Reserve arising from the sum received by your Company out of the *ex gratia* grant to British interests in Burma by His Majesty's Government to which I referred last year. This amount has meantime been invested in Government Securities, which you will observe are now held wholly by the Parent Company, and accounts mainly for the increase this year in the Group's holding now standing at £14,532,239. During the year Government Securities previously held by a Subsidiary were transferred to the Parent Company; this is reflected in the decrease in the Parent Company's investments in Subsidiary Companies.

Final adjusting settlement of the Back Service Liability in respect of the Staff Pension Fund was made during the year and the balance of "Provisions including Contingencies" under Current Liabilities is correspondingly lower than a year ago.

Under Current Assets the cost of financing the Group's

inventories of Stores and Materials and Products, and also Debtors, continues to rise under the influence of higher costs and prices.

TRADING

Our trading is conducted partly through the organizations of our own Subsidiary Companies in Burma, Assam and part of East Pakistan and partly on consignment to Burmah-Shell in the remainder of India and Pakistan. About 28 per cent of our supplies for sale in 1950 came from our indigenous production, the balance being imported.

In Burma there was some widening of the areas brought under the control of the Government but conditions generally continued to be disturbed and trade consequently limited. By means of Inland Water Transport convoys under armed escort we were able to supply Northern Burma with the products of a refinery unit at the Oilfields, while Rangoon and markets approachable from there were supplied with imported oil. By the end of the year about one-third of Burma's requirements, in the areas to which we could penetrate, were supplied with indigenous products. We hope to increase this percentage as security and economic conditions permit.

In India rationing was lifted over most of the country during the year and sales showed a marked improvement over 1949. The shortage of transport continued to be a restricting factor.

In Pakistan there would have been a larger increase of trade than in fact there was if there had been access for trading between India and Pakistan. The economic source of supply for more than half East Pakistan is Calcutta, but supplies for the whole of East Pakistan had to come from Chittagong involving in certain cases transport for some 300 miles to markets less than 100 miles from Calcutta. In addition to the waste of freight, this imposed a burden on Chittagong for which our facilities were not designed. Again, the economic route for the Assam Oil Company's products (Assam being a Province of India) is through Pakistan into India by the old railway, but they have had to travel by a new rail link built to avoid Pakistan, a fine bit of engineering but a longer journey by several days. It is to be hoped that these wasteful and expensive procedures will not be imposed upon trading much longer.

INVESTMENTS

Income from our investments quoted on Stock Exchanges contributed just under 25 per cent. of the total gross profit of the Group. Apart from our holdings in Government stock, our major investment is in Anglo-Iranian Ordinary Stock and Shell Ordinary Stock. While it would be improper for me to anticipate in any way the statement which the Anglo-Iranian's Chairman would no doubt be making to his stockholders on the present and future situation in Iran, these developments are of direct and particular interest to The Burmah Oil Company stockholders for historic as well as financial reasons. It was The Burmah Oil Company which in 1905 formed The Concessions Syndicate Limited to carry on exploration on the late Mr. W. K. D'Arcy's Persian Concession when Mr. D'Arcy, after four years of work, felt unable to continue, and it was this Syndicate which struck oil at Masjid-i-Suleiman on 26th May, 1908. In the following year the Anglo-Persian Oil Company Limited was floated with an initial capital of £1,000,000 in Ordinary shares and £1,000,000 in 6 per cent Participating Preference shares. The Burmah Oil Company took up 95 per cent of the Ordinary shares and guaranteed the Preference dividend for five years. The Company also acquired, and in due course made over to the Anglo-Persian Oil Company, Mr. D'Arcy's interest in Mesopotamia, out of which arose the important share which the Anglo-Iranian Oil Company now has in the oil development of Iraq.

BURMA

I have referred to the effect on our trading of the disturbed conditions in Burma. Compared with the state of the country in 1949, last year saw a marked improvement in internal communications and in the country's finances. By the end of the year nearly every main town was in Government hands, the Irrawaddy was open to river traffic, the railways were partially operating and some road transport was possible, if hazardous.

For your Subsidiary operating Companies the year 1950 was marked by the necessity for carrying out reductions in their labour forces. In my statement last year I informed you that the questions of the employer's right to discharge surplus employees and the terms governing such discharges had been referred to the Court of Industrial Arbitration in Burma. The resulting Award not only forbade us to discharge our surplus employees at Syrian but prescribed a task for

the Refineries Company to carry out while continuing to employ them. On appeal, however, the Supreme Court pronounced that the Industrial Court "have no authority to direct alteration of the ordinary course of the petitioner's business or to decide in what manner they should carry on their business."

The Oil Companies were then free to discharge surplus labour, though on onerous terms, and the discharges were completed during October. I must add that it was through no fault of ours that these reductions had become necessary; we would much rather they had not. They were due solely to the impossibility of fully restoring our operations in the state of lawlessness prevailing in the country.

While these Court cases were proceeding we felt unable to respond to the Burmese Government's enquiries as to our plans for future operations in Burma, but as soon as the cases were disposed of we informed the Government that it was our intention to expand our oilfields and refinery operations as and when internal security conditions permitted. In the state of security existing now and in sight, repair of the Main Pipeline can still not be contemplated and there is accordingly still no case for completing the rebuilding of Syrian refinery. In order therefore to supply petroleum products, in the first place to Upper Burma markets, and in the process to obtain a return on the capital already invested, refining on a small scale is being carried on at the oilfields and it is our intention to develop it up to its maximum economical capacity in the prevailing conditions.

On being informed of this programme the Burmese Prime Minister expressed the desire for a Joint Venture between the Government and the Oil Companies in place of the scheme which fell through two years ago owing to the Government's inability to finance their share. Responding to this request, we put before the Government the outline of a scheme for participation by them in a local Company. The Government have informed us of their desire and decision to participate, provided they can borrow the money to finance their share. There the matter stands at the moment.

In the meantime it is a matter for satisfaction that the somewhat strained relations which inevitably existed through most of last year have ended and that all our exchanges with the Burma Government are on a basis of friendliness and, I believe, trust on both sides.

INDIA

The crude oil production and refining operations of Assam Oil Co. Ltd., continued at the rate at which they have been stabilized for some years past.

In August the Digboi field was shaken by a serious earthquake which had its centre about 100 miles to the north-east in an uninhabited part of the Eastern Himalayas. Had this part been populated, the effect would have ranked as a major disaster. As it was, many of our buildings were extensively damaged but fortunately there was no loss of life in Digboi and the wells were undamaged.

PAKISTAN

Development of the field at Chakwal, in the Punjab, is proceeding in close association with the Attock Oil Co. Ltd., who have the lease over an adjoining area at whose refinery at Rawalpindi oil from both areas is processed.

PROSPECTING

Prospecting has continued in India and Pakistan. No resumption was possible in Burma.

In India an outside test well at Barsilla in Upper Assam was completed without finding oil in commercial quantities and preparations have since been made to test another Upper Assam structure at Nichuguard. Although we have so far had no success in these Assam outside tests it is noteworthy that extension drilling at Digboi itself has proved further additions to the productive area of that field.

Preparations were begun for drilling an outside test in Baluchistan (West Pakistan) and another at Patharia in East Pakistan.

Last year in order to conform with the Pakistan Petroleum (Production) Rules 1949 a local rupee company was incorporated in Pakistan to take over our Pakistan Concessions Subsidiary's interests. It is hoped that the necessary formalities to enable this company to commence business will soon be completed.

LABOUR

The discharges of labour in Burma to which I have referred affected some 2,400 men at Chauk Oilfields and 2,700 men at Syriam Refinery. Although it must have been obvious to the men for some time that there had ceased to be work for them each man no doubt hoped that the axe would not fall on him and it shows much for their restraint and, I hope

we may claim, for their experience of our fair dealing, that the atmosphere remained peaceful before, during and after the discharges and that no serious strike or disturbance took place. The labour now remaining on the payroll at Syriam is employed in connection with receipt and storage of oil.

In both India and Pakistan relations with labour remain good in spite of periodic claims from the Unions which are now a feature in these countries, encouraged by the appeasing awards of adjudicators appointed in recent years under the Trade Disputes Act.

TANKERS

Our tanker fleet operated satisfactorily and profitably during 1950 but its long record of immunity from serious accident was marred at the end of January this year when an explosion in our small packed oil tanker s.s. "Beme" resulted in the death of seventeen men, Burmese and Indian, four of whom were the Company's employees.

Orders have been placed for three more tankers to enable us to carry a greater proportion of our total sales requirements in our own ships and to bring down their average age.

STAFF

Your Companies are served by a loyal and efficient staff, who both at home and abroad, ashore and afloat, have continued to maintain their high standards. With your permission I shall convey to them the stockholders' appreciation.

The Report and Accounts were unanimously adopted.

The Final Dividend 12½ per cent (2s. 6d. per £1 unit) and the Cash Bonus of 6 per cent (1s. 2.4d. per £1 unit) on the Ordinary Stock for the year 1950, recommended by the Directors, was approved and declared payable on 20th July, 1951.

Mr. W. A. Gray and Mr. T. T. McCreath, the Directors retiring by rotation, were unanimously re-elected.

SCOTTISH AUSTRALIAN MINING CO.

INCREASED COAL OUTPUT

The Annual General Meeting of the Scottish Australian Mining Company, Limited, was held at Winchester House, London, E.C.2, on July 6th.

Col. I. R. I. Forbes, D.S.O., J.P., Chairman of the Company, who presided, in the course of his speech said:—

The Report and Accounts for the year ending 31st December, 1950, have been in your hands for the usual period—will you take them as read? (Agreed.)

At the last Annual General Meeting I had the pleasure of informing the stockholders of the successful conclusion of the protracted proceedings in connection with the Australian taxation assessments of this Company. It is with pleasure on this occasion I can announce to you finalization of another long drawn out matter. In 1947 the Housing Commission of New South Wales resumed just over 54 acres of our Lambton Estate for building purposes, on which we had already planned sub-divisions. The Commission offered us a sum in compensation for this resumption which we could not justifiably accept, and negotiations have been proceeding ever since. These negotiations have been very ably conducted by Messrs. Creer & Berkeley—the Company's Land Agents—and your Manager in Australia, Mr. Lee. Our thanks are due to them, for in May of this year the Board received word from the Manager that the Housing Commission had offered £14,000 gross in settlement. This sum, being more in accord with your Directors' idea of value of the land, was accepted and payment was received on the 31st May. On receipt of this sum the Board decided to make an early distribution of the surplus arising and of the surplus in hand in respect of land sales up to 31st December last.

The Board accordingly gave notice to stockholders on the 1st June of their intention to make a further distribution of eighteen pence per unit. It has been a source of satisfaction that since the last meeting we have been able to declare distributions of no less than 2s. 3d. per 4s. 0d. unit, all out of capital realizations which, not being assessable to Income Tax, are payable without deduction of tax.

You will be interested to note that since the Board commenced distributions of this nature in 1945, the sum of £49,542 (including the 1s. 6d. just announced) has been paid to stockholders and this is just on 4s. 0d. per unit. This is some compensation to stockholders for the very drastic capital loss suffered when the Board were forced to recommend that the £1 units be reduced to 4s. 0d. We have every hope that future realizations will add substantially to this sum.

We are continuing our policy of gradual liquidation of the Lambton estate and we have further subdivisions in view, but this policy is constantly under review. Twenty lots in the southern portion of the estate were sold at satisfactory

prices last year, but there are difficulties in planning these sales, as we are hampered by shortages of labour and materials. In addition, the County Council concerned has made preliminary reservation of a considerable area of the estate for green belt purposes, but we are hopeful that negotiations at present in progress with them will result in meeting their desires without too much interference with the Company's future disposal plans. The demand for land continues to be good.

With regard to the mining activities of the collieries under lease, I am pleased to say that last year the output of coal from these increased by no less than just on twenty thousand tons and this improvement is being maintained in the current year. The demand for coal is in excess of the supply, and the continual outcry (as in this country) is "more coal." As a result, all the three lessees have applied for additional areas to extend their workings to the west and mine hitherto untouched areas of the Victoria Tunnel Seam, and it is estimated that at the improved rate of production there should be about ten years' work. All the three lessees have been informed that their extensions will be granted (in fact, at Central No. 2 work has already started), but the final terms of the leases are still under consideration. We are therefore hopeful that the output of coal, and our revenue therefrom, will be maintained.

This year we have again close personal touch with our Australian property, because Mr. Norman Eggar, one of the Directors, is at present in Australia. He is firstly there as Chairman and Managing Director of The Scottish Australian Company, but he has been to Newcastle, N.S.W., and spent two days inspecting the collieries and our Lambton estate and has had most useful talks with our officials and advisers; thus your Board is keeping in personal touch with the management on the other side. After his visit Mr. Eggar sent me a most interesting letter telling us what he had seen and his opinion as to the future. He saw the lessees of our three coal mines and reported most satisfactorily on their work and efforts. Those of Crofton and Borehill work with their men, and work hard. The lessee at Lambton Central has much coal mining experience and gets on with the job. So all seems to be satisfactory as regards that side of the Company's affairs.

Mr. Eggar reports most favourably on the sites we have in mind for early realization, and sums up his report to me as follows:—

"I was well satisfied with our visit, with the way the collieries are being worked and certainly with the able way in which Littler is looking after our interests in Lambton."

With regard to the accounts—I need not say much about them. They are clearly set out, and comparative figures are put alongside showing the amounts of the previous year. Rents, royalties and interest have increased by £1,169. The administration expenses remain practically the same, and your Board considers the final result on the Profit and Loss Account of £1,011, against £252, to be satisfactory. This, together with £539 on account of taxation adjustments, enables the Board to recommend payment of a dividend of 6 per cent. which, after deducting Income Tax, will absorb £1,575, and leaves £57 to be carried forward.

Our investments in Commonwealth Loans and British Government securities remain at £42,737 and £940, respectively, which, together with our other investments, such as Broken Hill Proprietary Company and The Steamships Trading Company shares, exceed the present capital of the Company, so I think we are in a really sound financial position. The statement at the foot of the Balance Sheet sets out the movements on reserves since the last report.

I cannot bring my remarks to an end without mentioning the really good work of your Manager, Mr. Lee. I told you on previous occasions how well he has done for us but that he needed a holiday. I am glad he has had a change, as he took a sea trip to Western Australia which has done him good. I am, however, sorry to say his health was none too good at the time of Mr. Eggar's visit and that he was unable to accompany Mr. Eggar on his trip to Newcastle. Mr. Lee has been so successful in the big taxation case, and now that the anxieties of the Housing Commission resumption matter have been removed, I hope his health will improve. Mr. Fish, the Deputy Manager, went to Newcastle with Mr. Eggar, and is doing most excellent work and must be a comfort to Mr. Lee.

Before I close I must bring to the notice of stockholders the very outstanding piece of work done by Mr. Littler of Messrs. Creer & Berkeley, in getting such a satisfactory price for the resumed land. He never spares himself in the interests of the Company, and I ask if I may send your congratulations to him, for he deserves them.

The report and accounts were unanimously adopted.

LYNDHURST DEEP LEVEL (GOLD & SILVER)

The Annual General Meeting of Lyndhurst Deep-Level (Gold and Silver), Ltd., was held at the Chartered Insurance Institute, 20, Aldermanbury, London, E.C., on July 10, Mr. Robert Annan, M.I.M.M., the chairman, who presided, in the course of his speech said:—

Compared with the previous year, the total development underground has been more than doubled, the tonnage of ore milled was increased by 85 per cent., and the higher price of gold was received for the full year. As a result both the proceeds of gold and the mine expenditure have been more than doubled and mining revenue has covered all cash expenditure, with a margin of about £5,800. In addition we received a net dividend of £14,896 on our Konongo holding. After providing for depreciation and bringing in a refund of gold duty paid last year there is an available balance of profit for the year of £21,759, out of which we recommend the payment of a dividend of 5 per cent., less tax, absorbing £11,550, and leaving £10,209 to be added to the carry-forward.

Coming now to operations at the property, 32,995 tons of ore were milled, producing 10,271 oz. of gold including 131 oz. from accumulated slags. Of the tonnage treated 56 per cent. came from stoping, 21 per cent. from development and 23 per cent. from dumps, which are now exhausted.

While the total development footage was more than doubled, the footage driven on reef at 3,069 ft. is nearly three times the previous year's figure. Unfortunately only 440 ft., or 14.3 per cent., proved payable.

The underground ore reserves at 61,715 tons averaging 14.7 dwt. per ton over 37 inches show a decrease of 14,705 tons with an increase of 1.8 dwt. and reduced width of 1 inch, when compared with last year's figures.

Last year I referred to the detailed surface prospecting which had been done to the north-east of the Boabedroo workings. This work has been pressed on to the south-west and a further 9 square miles were covered during the financial year on the Ocomadesia and Odumase Concessions involving the cutting of 65 miles of lines in the bush and the examination of over 6,000 samples. This work is still continuing and wherever the surface samples give sufficient encouragement the ground is being further tested by trenching and diamond drilling.

To sum up the results of recent development: the results in the Zongo workings have been unpromising. In the Boabedroo workings the 4th level is being driven on to pass under the exposures some 2,000 feet north-east of the shaft where surface indications were found, but diamond drilling was disappointing. This level still has about 1,000 ft. to go to reach the objective. In depth, work is being pushed on below the 9th level to see if any extension can be found in our ground of the rich ore on the 6th, 7th and 8th levels but which was not present in Lyndhurst ground on the 9th level.

A surface exposure some 1,000 ft. south-east of the Boabedroo shaft and possibly on the line of the Awere Reef of Konongo will be explored in due course from an extension of a Konongo working, which is being driven up to the boundary and will be continued into Lyndhurst ground. On the other side of Konongo a surface exposure, where diamond drilling results have admittedly been disappointing, will be further tested by the 9th level of Konongo which is advancing to the boundary and will be continued in our ground. The surface geological survey has disclosed a second area further to the south-west where quartz exists in abundance on the surface. Trenching here has exposed several small quartz reefs on which sampling has given disappointing results but these reefs are now being tested at greater depth by diamond drilling.

Finally, the surface survey has disclosed a manganese-bearing zone which has been traced over a length of several thousand feet. The material so far sampled is below commercial grade but work is in progress to obtain some idea of the total tonnage available and if this appears to be adequate concentration tests will be undertaken to see if a marketable product can be produced.

We retain our interest in the Konongo Mine which made last year a net profit after taxation and depreciation of £69,211 and paid a dividend of 10 per cent., less tax. Development in depth in this property continued to be without success and efforts are now being directed to the testing of the remaining lateral extensions of the veins which have not yet been explored.

So far as our own property is concerned, we are continuing the exploration of our concessions as rapidly and as thoroughly as we can and, for the present, are covering the cost of the work from the proceeds of ore treatment, retaining the unexpended balance of our capital intact.

The report and accounts were adopted.

IDRIS HYDRAULIC TIN LTD.

MR. R. C. SAVORY'S STATEMENT

The Thirty-Seventh Annual General Meeting of Idris Hydraulic Tin, Ltd., was held on July 11th at the registered office, 73, Cheapside, E.C.2.

Mr. Rudolph C. Savory, Chairman of the Company, presided.

The following is an extract from the circulated Statement of the Chairman:

The Report and Accounts for the year ended 31st December, 1950, reflect the improvement in the price of tin during the year.

The output of ore, 263 tons, is almost identical with that of the previous year and that the higher grade of ground 2.12 lbs. per cubic yard offset the lower yardage treated of 278,500 cubic yards but the average value of the ore produced increased from £385 per ton to £496 per ton.

With regard to War Damage, settlement of some claims for rehabilitation is now taking place but so far we have not received any notification as to our own claim, against which we have received a loan from the Malayan Government of £49,459.

I drew attention last year to the urgent necessity of increasing the financial strength of the Company and it is towards this purpose that we have doubled the Reserve Account.

The security position seems to show gradual improvement although the situation is still serious. We may regard ourselves as fortunate in having escaped any major attack or damage. The strain on our staff remains unabated and in-

creasing demands are constantly made by the Government upon all. The resettlement programme now in progress is involving us in very considerable expense, and it is to be hoped that a better feeling of personal security will result in the receipt of reliable information against bandit activity.

The following table of percentages of our gross revenue before charging Tin Duty will, I think, be of interest:—

Taxation (including		41.1 per cent. of gross revenue	
Tin Duty £21,338)			
Mining Costs	36.2	"	"
London Expenses	3.2	"	"
Reserve Transfer	9.0	"	"
Dividends	11.9	"	"
	101.4		
Less—Reduction in			
Carry Forward	1.4	"	"
	100.0		

During the five months January to May, 1951, the output amounts to 89½ tons of tin ore.

As has already been announced a cabled report has been received from the General Managers that a large land-slip has occurred in the Batu Karang section of the property, involving loss of equipment and the closing of the north portion of the existing paddock. This will adversely affect outputs for some considerable time.

The Report and Accounts were adopted.

THE CENTRAL MINING—RAND MINES GROUP

DIVIDENDS ON SHARES TO BEARER

The following dividends will be paid on or after August 9, 1951, after surrender of the appropriate coupons at the London Office of the Companies, 4, London Wall Buildings, E.C.2, or, with the exception of the Company marked with an asterisk, at the Crédit Lyonnais, Paris.

The dividends will be payable in British currency, at par, at the rates declared in South African currency (Column No. 4), less South African non-resident shareholders' tax (Column No. 5).

COUPONS presented for payment at the London Office will, unless accompanied by Inland Revenue declarations, be paid at the rates shown in Column No. 12, which are arrived at after deduction of United Kingdom income tax (Column No. 11), at rates reduced to allow of relief in respect of Dominion taxes.

COUPONS presented at the Crédit Lyonnais, Paris, will be subject to the deduction of French income tax from the amounts of the dividends shown in Column No. 6.

NAME OF COMPANY (Each incorporated in the Union of South Africa.)	Dividend No.	Coupon No.	Amount of dividend declared per share.	Deduction in respect of South African non-resident shareholders' tax, per share.	Amount of dividend after such deduction, per share.	Provisional rate of relief authorised in the £.	Gross amount of dividend, per share.	Rate of Dominion taxation applicable in the £.	Rate of deduction of United Kingdom income tax in the £.	Amount of United Kingdom income tax deducted, per share.	Net amount of dividend per share.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			s. d.	d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
City Deep, Ltd.	63	63	3 0	2.70	2 9.30	4 9	3 7.67	—	4 9	10.37	1 16.93
Consolidated M. Reef M. & E. Ltd.	83	80	3 6	3.15	3 2.85	4 9	4 2.95	8 3	4 9	1 0.10	2 2.75
Crown Mines, Ltd.	100	100	5 6	4.85	5 1.05	4 9	6 8.07	—	4 9	1 7.02	3 8.03
Durban Roodepoort Deep, Ltd.	61	61	2 6	2.25	2 3.75	4 9	3 0.39	—	4 9	8.64	1 7.11
East Rand Prop. Mines, Ltd.	63	64	2 6	2.25	2 3.75	4 9	3 0.39	—	4 9	8.64	1 7.11
Modderfontein East, Ltd.	48	29	3 0	2.70	2 9.30	4 9	3 7.67	9 8	4 9	10.37	1 16.93
Rand Mines, Ltd.	96	96	3 6	2.85	3 3.51 15	4 9	4 3.81 84	—	4 9	1 0.30 69	2 3.20 46
Rose Deep, Ltd.	92	92	2 9	2.475	2 6.525	4 9	3 4.033	—	4 9	9.508	1 9.017
Transvaal Gold M. Ets. Ltd.	81	81	1 0	0.80	11.10	2 10	1 0.93	—	6 8	4.31	6.79

Coupons required to be paid at the London Office must be left at least four clear days for examination and may be presented any day (Saturdays excepted) between the hours of 11 and 2. Depositors will be notified at the time of deposit when the cheques will be ready.

Listing forms may be had on application.

Where no figure is shown in Column No. 9, the rates of Dominion taxation applicable in the £ cannot yet be ascertained, as they are dependent on the final particulars of the South African taxation of the companies concerned, which are not yet available.

Note.—The Companies have been asked by the Commissioners of Inland Revenue to state:—

Under the provisions of Section 36 and the Sixth Schedule of the Finance Act, 1950, relating to "unilateral relief" from double taxation, South African tax applicable to the dividends is allowable as a credit against the United Kingdom tax payable in respect of the dividends. The deduction of tax at the reduced rates in the £ (Column No. 10) instead of at the Standard Rate of 9s. 6d. in the £ represents a *provisional* allowance of credit at the rates shown in Column No. 7. The final rate of credit allowable to a particular shareholder depends on his personal rate of tax; it may be more or less than the rates shown in Column No. 7 but must not exceed three-quarters of the personal rate. Revision of the credit involves corresponding adjustments of the gross amounts of the dividends for United Kingdom tax purposes (Column No. 8).

THE GROSS AMOUNT OF THE DIVIDEND TO BE INCLUDED IN ANY STATEMENT OF TOTAL INCOME FOR UNITED KINGDOM INCOME TAX PURPOSES IS SHOWN IN COLUMN No. 8.

4, London Wall Buildings, London, E.C.2.

July 10, 1951.

A. MOIR & CO.

London Secretaries of the above-named Companies.

May Mine Returns

Gold

WEST AFRICA

Amalgamated Banket.—53,489 tons yielded 7,369 oz.; profit £23,420.
Ariston.—26,630 tons yielded £101,184; profit £37,519.
Bibiani.—28,049 tons yielded 6,005 oz.; net mines profit £83,339.
Bibiani.—28,049 tons yielded 6,005 oz.; net mines profit £14,004.
Bremang.—759,900 yds. from 4 dredges yielded 3,027 oz.
Gold Coast M.R.—7,166 tons yielded 2,508 oz.; profit £4,311.
Konongo.—3,035 tons yielded 2,350 oz.; profit £9,710.
Nanwa.—3,498 tons yielded 411 oz.
Taqaah.—21,500 tons yielded 5,521 oz.; profit £9,202.

INDIA

Champion.—15,080 tons yielded 5,544 oz.
Mysore.—16,350 tons yielded 4,906 oz.
Nundydroog.—17,450 tons yielded 4,947 oz. (including 27 oz. from old tailings).
Ooregum.—8,981 tons yielded 2,217 oz.

AUSTRALIA

Boulder Pers. (Apr. 25-May 22).—7,611 tons yielded 1,670 oz.
Central Norseman (Apr. 24-May 22).—11,534 tons yielded 2,675 oz.
Croesus Prop. (Apr. 25-May 22).—6,724 tons yielded 1,176 oz.
Golden Horsehoe.—19,959 tons of tailings yielded 545 oz. gold and 535 oz. silver.
Gold Mines of Kalgoorlie (Apr. 24-May 22).—13,152 tons yielded 3,575 oz.
Harrierville (Tronoh) (May 6-June 2).—173,500 cu. yd. dredged yielded 179 oz.
Kalgoorlie Enterprise (Apr. 25-May 22).—3,584 tons yielded 1,218 oz.
Kalgurli Ore (Apr. 25-May 22).—14,081 tons yielded 3,151 oz.
Lake View & Star (Apr. 25-May 22).—48,088 tons (and 25,329 tons retreated tailings) yielded 10,011 oz.
New Coolgardie (Apr. 24-May 22).—3,616 tons yielded 1,663 oz.
Sons of Gwalia (Apr. 25-May 22).—3,444 tons yielded 587 oz.
South Kalgurli.—7,719 tons yielded 1,828 oz.

MISCELLANEOUS

Brit. Guiana Cons.—72,427 cu. yd. dredged yielding 371 oz.
Cam & Motor.—19,500 tons yielded £56,633, profit £23,426.
Clutha (Apr. 1-May 25).—Dredge worked 378 hours yielding 366 oz.
Frontino.—10,017 tons yielded 4,983 oz.
Geita Gold.—17,000 tons yielded 2,782 oz.
Martha (May 1-19).—5,263 tons yielded 1,181 oz. gold, 7,534 oz. silver.
Motapa.—24,000 tons yielded 2,397 oz.; profit £4,101.
Rezende.—6,800 tons yielded £12,824; profit £1,471.
Saudi Arabian.—5,529 tons assayed 1,088 oz., and 534 tons reclaimed tailings assayed 0.283 oz.; profit £38,482.
St. John D'el Rey.—32,400 tons; value of output £235,811.

Tin

MALAYA

Ampat.—81½ tons conc.
Batu Selangor.—12½ tons conc.
Berjuntai.—53 tons conc.

Ipoh.—5½ tons.
Jelapang.—29½ tons conc.
Kampung Lanjut.—36½ tons conc.
Kamunting.—258½ tons conc.
Kinta Kellas.—18 tons.
Kinta Tin.—42 tons.
Klang River.—26 tons conc.
Kramat Tin.—27 tons conc.
Kuala Kampar.—186 tons conc.
Kuchai.—66½ tons conc.
Larut.—64½ tons conc.
Lower Perak.—72½ tons conc.
Malaysiam.—6 tons.
Rahman.—41 tons.
Rantau.—38½ tons conc.
Rawang Conc.—51 tons conc.
Rawang Tin.—127 tons conc.
Renong.—90 tons.
Southern Kinta.—278½ tons conc.
Sungei Kinta.—44 tons.
Taiping.—77½ tons conc.
Tambah.—18½ tons conc.
Tanjong.—88 tons.
Tongkah Harbour.—48½ tons conc.

NIGERIA

Amalgamated Tin.—302 tons tin conc. and 19 tons columbite.
Bisichi.—53 tons tin and 15 tons columbite.
Ex-Lands Nigeria.—35 tons.
Filani.—4½ tons.
Gold & Base Metal Mines.—42 tons conc.
Jantar Nigeria.—24 tons tin and 20 tons columbite.
Jos Tin.—11 tons conc.
Kaduna Prop.—3 tons.
Kaduna Synd.—20 tons.
Keffi.—15 tons conc.
Naraguta Extended.—7½ tons.
Naraguta Karama.—12½ tons.
Naraguta Tin.—20½ tons tin and 7½ tons columbite.
Ribon Valley.—3 tons.
Rukuba.—1½ tons.
South Bukuru.—4 tons.
Tin Fields of Nigeria.—2½ tons.
United Tin Areas.—7 tons conc.

MISCELLANEOUS

Bangrin Tin.—75 tons.
Geevor.—5,230 tons yielded 65 tons tin (65 per cent Sn.).
Siamese Tin.—111 tons.
South Crofty.—2,644 tons yielded 27 tons tin and 1 ton wolfram.

Coal & Miscellaneous Base Metals

Broken Hill South (May 6-June 2).—23,270 tons ore (assaying 70.7 per cent lead, 51.8 per cent zinc and 43.2 oz. silver yielded 3,636 tons lead conc.; 4,668 tons zinc conc.
New Broken Hill (Apr. 29-May 26).—19,766 tons ore (assaying 8.5 per cent lead, 12.2 per cent zinc and 2.0 oz. silver) yielded 2,121 tons lead conc. and 4,306 tons zinc conc.
Rhodesia Broken Hill.—1,855 tons zinc, 1,200 tons lead and 15½ tons fused vanadium.
Wankie Colliery.—183,335 tons coal sales and 8,285 tons coke sales.
Witbank Colliery.—132,349 tons coal.
Zinc Corporation (Apr. 29-May 26).—37,044 tons ore (assaying 14.4 per cent lead; 12.1 per cent zinc; 3.1 oz. silver) yielded 6,884 tons lead conc. and 7,785 tons zinc conc.

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